











# SCIENTIFIC MANAGEMENT SINCE TAYLOR

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### SCIENTIFIC MANAGEMENT SINCE TAYLOR

# A COLLECTION OF AUTHORITATIVE PAPERS

## EDWARD EYRE HUNT

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#### DEDICATED

TO THE MEMORY OF

FREDERICK W. TAYLOR



#### **FOREWORD**

#### BY MORRIS LLEWELLYN COOKE

The term "scientific management," used either as a slogan or as the terse expression of an industrial creed, has come to signify a complex of forces—mechanical, economic, social and human—which have developed very largely within the last 25 years out of the efforts to introduce scientific determinism into work.

Industrial centralization and mass production created a demand for an enginery and machinery for industry beyond the reach of thumb rules. Within a generation John Fritz sketched the moving parts of a reciprocating engine on the sand floor of a foundry. But before we could reach our present 60,000-h.p. steam-turbine units we needed not only the paraphernalia of the drafting room, but back of it the patience and learning inevitable to research and the laboratory. The shovel and the barrow and the basket as implements for moving coal and ore from shore to ship have yielded to the 50-ton car picked up bodily and dumped into the hold. Our metals have become stronger, lighter and cheaper. Thus, even within the few years just past marvelous progress has been made in applying law to the more tangible factors of industry—to its materials, to its equipment and to its tools.

Mathematics and its kindred sciences having thus proved useful and profitable in the design of machinery, their application to the operation of those same machines was only the next logical step—hence routing, time study and the machine-tool slide rule. It is true that in the field of operation we may still see in many directions conspicuous examples of failure to coordinate, of narrowness of view, of adherence to the outworn, and of the absence of any recognizable technique. But the fact that, broadly speaking, the break has been made with the past is all-important. I recall one book plant which less than 20 years ago had no use for any measuring instrument—not even for a foot rule. There was no effort toward exactitude anywhere. Measurement, of course, is of the very essence of book making, but wherever practiced in this plant it was from memory or com-

parison, aided at times by the length of the thumb or the distance from elbow to finger-tip, or by marked strings, or by bits of board or of cloth. In the intervening years the book as an industrial product and each of its parts have been analyzed, so that the relationship of each part to the other and to the whole is capable of exact mathematical expression. This illustration is typical of countless others. We no longer consider the tongue and the sense of taste as the equivalent of chemical analysis. Within 15 years in one press room—and on one day—the use of kerosene, mutton suet and "tobacco juice" in treating recalcitrant printing inks was reported. Sensitive weighing machines have made obsolete the "pinch," the handful or the cupful. The micrometer has driven out sheet tin, tissue and newspaper as units of measurement—the only ones used in my apprentice days in certain classes of work. And so, first in the construction of industrial apparatus and now in the world of industrial process, we find some measure of order, of definition, of standardization and of control has been introduced through the initiative of science.

But, after all, personnel, as contrasted with material, is the dominant factor in industry. Therefore, admitting as possible everything that can be hoped for in the application of science to both equipment and process, unless we can develop determinative methods in the human relationships of industry we build our industrial house upon the sand. Law—essential law—must eventually become recognized in this admittedly complex area where individual and group human interests are in constant conflict—or rather constant maladjustment. Men and women as agencies of industry are, indeed, far removed from the category of machines and yet both men and machines in their conduct are controlled by law—recognized or not as the case may be.

As recently as four years ago a signboard reading "Hands Enter Here" was removed from the employees' entrance of a large and well-known industrial establishment in an eastern seaboard city—this to make possible the recognition of heads and hearts as well. With the gradual diminution of the "commodity" theory as affecting labor and the ushering in of the period of "good will" and "cooperation," there has come a new incentive for definition in industrial relationships. It is coming to be understood that cooperation can only be nourished through good management and in an atmosphere of orderliness and system. Good intentions, whether of men or of management, in the long

run only find expression in the execution of carefully worked out plans. Injustice and strife spell waste and inefficiency. Scientific management in human relations means constantly broadening the bases of mutual understanding and respect.

It is the design of this book not only to emphasize the importance of human relations but to show how and where the beginnings have been made in organizing these relations on fundamental lines. It is a long vista which is thus opened up. But the next steps in the journey are reasonably clear. Science has a way of transforming the intangibles of today into the tangibles of tomorrow. The progress recorded in the following pages is marked to the point of being revolutionary. It is only because we are too near to it that we do not recognize the fundamental character of the changes that have overtaken industry as to machines and process—and even more markedly as to men.



#### INTRODUCTION

In studying these collected papers on the more recent aspects of scientific management the reader will be impressed with the great advance in the management movement since the death of its founder, Frederick W. Taylor, in March, 1915. Taylor died a discouraged man, if anyone with his high heart could ever be discouraged. After the flare of public interest in 1911 and 1912, he and his work were much neglected. Only a few disciples were steadfast throughout.

It was the war which forced scientific management again to the fore. Mass production on an immense scale, the need for greater and constantly greater output—these made of the principles which Taylor had laid down the highway to victory, and those who had never heard his name were enrolled among his followers. Not that they adopted his system of management. It is necessary to distinguish between that finely articulated machine-shop mechanism of his and the rough-and-ready machinery of the war emergency. But the principles were his; and there were not lacking men in high places, civil and military, who advanced the cause of scientific management to the benefit of their country and of the world.

In other countries, too, the war forced scientific management to the front. A conspicuous example was that of France, where Premier Georges Clemenceau early in 1918 called on the heads of all military establishments to study and to apply the methods of scientific management. Even in Bolshevik Russia, in April, 1918, Premier Nikolai Lenin declared, "We must introduce . . . the study and teaching of the new Taylor System and its systematic trial and adaptation."

The end of the war offered a still wider field of opportunity. It was evident that a harrowing period of international competition lay ahead. Reconstruction would obviously be a vastly harder task than the task of destruction. This was the great opportunity of scientific management.

<sup>1</sup> See Copley, Frank B., "Life of Frederick W. Taylor," book 7, chap. VII, Harper & Bros., New York, 1923.

And how has scientific management used its opportunity? It faced the task of reconstruction armed with Taylor's examples of machine-shop organization, his inventions and his classic papers—"Shop Management," "The Principles of Scientific Management," "The Art of Cutting Metals," "A Piece Rate System" and "Notes on Belting." There was also the work of Gantt, Barth, Hathaway, Thompson, Emerson, Gilbreth, Cooke and a few others, and a "fairly extensive literature" by these men and by popular journalists. But scientific management dwelt chiefly in the machine shop and the toolroom. The general public was indifferent. Organized labor was suspicious. The psychologists and economists were inactive allies. Some of the Taylor engineers seemed not unwilling to think of themselves as the devotees of a cult preaching a prescribed ritual.

In the few years since the war, the function of the management engineer has amazingly broadened. Not mechanical but human problems are in the foreground; and the papers in the present volume will show in part how scientific management has advanced into this broader field.

This does not mean that it has forgotten its origin. The background is and always will be the extraordinary work and the character of Frederick W. Taylor—a work and a character the importance of which will be seen more and more clearly as time goes by. It is still necessary to go back to Taylor for definitions and fundamental principles. But scientific management is a dynamic thing; its principles are the principles of growth and change, and it is for that reason that its progress since the war has been sure and swift.

A vital development has been the effort, under the inspiration of Herbert Hoover as President of the Federated American Engineering Societies and as Secretary of Commerce of the United States, to develop a scientific basis for the elimination of the wastes due to the inefficient functioning of industry both in production and in distribution. In a foreword to the report entitled "Waste in Industry," made by a committee of 17 engineers appointed by Mr. Hoover, he says:

We have probably the highest ingenuity and efficiency in the operation of our industries of any nation. Yet our industrial machine is far from

<sup>&</sup>lt;sup>1</sup> See "Waste in Industry," by the Committee on Elimination of Waste in Industry of the Federated American Engineering Societies, McGraw-Hill Book Co., Inc., New York, 1921.

perfect. The wastes of unemployment during depression; from speculation and overproduction in booms; from labor turnover; from labor conflicts; from intermittent failure of transportation of supplies of fuel and power; from excessive seasonal operation; from lack of standardization; from loss in our processes and materials—all combine to represent a huge deduction from the goods and services that we might all enjoy if we could do a better job of it.

The burden of the Waste Report is that the management of industry—and by "management" the report means those who are responsible for the formulation of policies as well as for their execution—is primarily to be charged with the responsibility for the elimination of these wastes. Labor has a share of responsibility, and the public and financial interests are also charged with some measure of the duty of making the industrial organization more serviceable. But the chief responsibility is attributed to industrial management.

As Secretary of Commerce, Mr. Hoover has still further developed the rôle of science in the elimination of industrial wastes. The Division of Simplified Practice in the Department of Commerce, continuing in time of peace the war work of the Conservation Division of the War Industries Board, has been organized as a national agency through which the elimination of wasteful types and varieties of products, processes and methods can be brought about as a result of voluntary agreement by groups of producers, distributors and users. The Division of Building and Housing has been developed in order to eliminate wastes in building by developing uniform municipal building codes, by studying the losses and wastes in financing home building and by studying city and town zoning.

The report of the President's Conference on Unemployment,<sup>1</sup> of which Mr. Hoover was chairman, and the reports of its subcommittees, such as the Committee on Business Cycles and Unemployment<sup>2</sup> and the Committee on Seasonal Operation in the Construction Industries,<sup>3</sup> all emphasize the social importance

<sup>1</sup> See Report of the President's Conference on Unemployment, Herbert Hoover, Chairman, Government Printing Office, Washington, D. C., 1921.

<sup>3</sup> See "Seasonal Operation in the Construction Industries," Report and Recommendations of a Committee of the President's Conference on Unemployment, McGraw-Hill Book Co., Inc., New York, 1924.

<sup>&</sup>lt;sup>2</sup> See "Business Cycles and Unemployment," Report and Recommendations of a Committee of the President's Conference on Unemployment, including an investigation made under the auspices of the National Bureau of Economic Research, McGraw-Hill Book Co., Inc., New York, 1923.

of attacking seasonal and cyclical unemployment by solving scientifically the basic problems of industrial instability.

The enlargement of the field of scientific management has resulted in enlarging its spirit. Taylor was no psychologist and he was not an economist. When he fought "soldiering" on the part of the workers, he fought it through an appeal to the wage motive. Today the management engineer is working with the psychologist and the economist. He has found that neither the wage motive nor the profit motive is enough. An appeal to the creative spirit and the spirit of service is also necessary.

This means that scientific management is becoming a part of our moral inheritance. Taylor has won a victory for the science of management which is no less overwhelming than Pasteur's victory for bacteriology.

Thoughtful men in all branches of science now hail in Taylor a master-builder. They may differ on details; they agree on principles. Engineers, social scientists, physicians, economists, psychologists, responsible leaders of American labor—all speak the same language. And the language they speak is the language of better management, of increased production and of constantly higher standards of living and of performance.

In partial confirmation of this, two striking statements of Samuel Gompers, President of the American Federation of Labor, may be quoted in conclusion:

One of the early attempts to apply science to labor questions came with types of scientific management that treated wage-earners as machines or simply laboratory material. Organized labor resisted—that resistance helped to humanize concepts and methods in management, until now the human nature of the workers is recognized as the fundamental factor in determining policies . . . .

Efficiency in industry is of paramount importance. The development of and adherence to this principle will enable us to make wonderful progress in a higher, better, safer and more permanent civilization. Society, the state and our people cannot afford to ignore the fundamental principles which make for success.

The first step toward a solution of the problem is the acquiring of information and the analysis of experiences. To ascertain fully that the causes of unemployment are forces which can be ascertained, analyzed and classified is to have taken the first great primary step toward solution.<sup>1</sup>

<sup>1</sup> See address of Samuel Gompers before the Preliminary Conference on Industrial Research, Washington, D. C., November 12, 1920, and the American Federationist, December, 1921.

I take pleasure in acknowledging my indebtedness to the authors whose contributions appear in the following pages, to the Bulletin of the Taylor Society in which most of these papers first appeared, and especially to Dr. H. S. Person, managing director of the Taylor Society, for constant help and encouragement in the selection of the material, and to Morris Llewellyn Cooke, consulting engineer, for the inception of the plan for the book and for valuable suggestions in carrying it out. I am also indebted to Frank B. Copley's "Life of Frederick W. Taylor"—an important biographical contribution to the literature of scientific management—and to the excellent critical work of Dr. Horace B. Drury.

E. E. H.

The Bookhouse, Riverside, Connecticut, June, 1924.



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### SCIENTIFIC MANAGEMENT SINCE TAYLOR

#### PART I

# NATURE AND ACHIEVEMENTS OF SCIENTIFIC MANAGEMENT

#### INTRODUCTORY

The review of the nature and achievements of scientific management presented in Part I covers a statement of its history, an examination of the types of management and a critical analysis of the accomplishments, shortcomings and obligations of scientific management.

Dr. H. S. Person, one of the leaders in the management movement and for a number of years managing director of the Taylor Society, presents in the chapter called "Scientific Management—A Brief Statement of Its Nature and History," a compact account of the origin and development of scientific management, together with a summary of its results, with special attention to the attitude of labor and the influence of the World War.

In the chapter, "Types of Management," Henry P. Kendall, a leading manufacturer and banker of Boston, Massachusetts, discusses unsystematized, systematized and scientific management, thus furnishing a basis for the appraisal of current industrial practice. He also analyzes the effect of the three types of management on the plant, the product, the worker and the manager.

Mr. Kendall's chapter was written in 1911, but no later analysis has so well covered this ground; hence it has been included in this collection.

Dr. Person's discussion of "The Contribution of Scientific Management to Industrial Problems" begins with the revolutionary work of Taylor in shop management, but emphasizes the importance of better management in the administration of the enterprise as a whole.

Just as shop management may bring specific orders, jobs, workers, machines and materials into a harmonious and economical relationship, mutually profitable to employers and workers, so the management of the enterprise as a whole may bring orders in mass, workers in mass, materials in mass and equipment in mass into a similar harmonious and economical relationship, mutually profitable. Sales engineering and market analysis, budgets, master plans and schedules of sales, finance and production, and consolidated departmental reports are a part of this larger mechanism.

Emphasis is laid on the service motive.

Dr. Person also describes the contribution of scientific management to American industry as a whole.

H. H. Farquhar, Assistant Professor of Industrial Management of the Harvard Graduate School of Business Administration, examines "The Positive Contributions of Scientific Management" from the point of view of the economic importance of the work which Taylor began. He shows that factory technique is being applied with success to other departments and, finally, that scientific management has been of great importance in its general influence on industry. He asks, however, if sufficient weight has been given to the question of personality in management; if the need of real leadership under scientific management is realized as even more necessary than under the older types of management; if there has been sufficient emphasis on group dealings; if the question of fatigue has not been treated from a standpoint too coolly scientific; if the importance of the contribution of labor, and especially of organized labor, has been sufficiently appreciated. Mr. Farguhar also questions if there is sufficient analysis before attempting to apply scientific management in business enterprises, and, finally, if the management movement has been properly conscious of the necessity of educating the public, and especially the management public, to the importance of science in management. From these points he derives his suggestions regarding the obligations and future problems of the movement.

An important point in Mr. Farquhar's chapter is the measurement of management.

#### CHAPTER I

#### SCIENTIFIC MANAGEMENT

#### A BRIEF STATEMENT OF ITS NATURE AND HISTORY<sup>1</sup>

BY H. S. PERSON

**Definition.**—The term scientific management characterizes that form of organization and procedure in purposive collective effort which rests on principles or laws derived by the process of scientific investigation and analysis, instead of on tradition or on policies determined empirically and casually by the process of trial and error. The principal phases of scientific management are: (1) Exhaustive investigation of the elements usable in collective effort—manual and machine processes, materials, tools and equipment, physical and psychological operating conditions—and their reactions in all possible relations, in order to determine the combination which, for any specific purpose, is most economical in technical energy—human and material; the formulation of the results of such investigation in principles and laws and the establishment, on the basis of such principles and laws, of standards of procedure and result. (2) The development and maintenance of such precise and automatic coordination and control of the collective effort as to accomplish, in accordance with the established standards of procedure and result, with economy of energy and time, any purpose of the collective effort. (3) Organization of the personnel, processes, materials and equipment in such functional cooperative relation as to bring to bear in the collective effort the highest available and developable technical skill in planning, supervision and execution.

A clear understanding of scientific management requires that management be not confused with administration. Management characterizes the organization and procedure through which collective effort is effected; administration characterizes those considerations and decisions which establish the purposes which

<sup>&</sup>lt;sup>1</sup> An article prepared for the Encyclopedia Americana, and printed here by permission of the Encyclopedia Americana

create the need for management and those broad governing policies under which the management proceeds. Whether a railroad shall expend capital in further development of a main line for better service or in the acquisition of feeders for larger traffic, whether a manufacturer shall distribute through the established trade channels or through branches and stores established by himself, whether a department store shall sell trade-mark merchandise or private-brand merchandise, whether any institution shall operate in an extensive or a restricted area, serve a particular class of the public, establish an open or closed shop or admit its workers to some sort of participation in administration and management are administrative problems. These problems once settled and policies relating thereto determined by the administrative authority (which may overlap or even coincide with the management authority), managerial problems arise concerned with establishing an organization and procedure, and the conduct of such procedure, to carry out the administra-With this distinction between administration and tive policies. management clearly in mind, it may be understood that administration is largely a process of forming judgments, may have serious social, political and other moral aspects, must be largely empirical and can utilize in but a limited way principles and laws determined by the scientific method of investigation; whereas management, on the other hand, is concerned with the relations and reactions of particular forms of organization, routine, materials, equipment and physical and psychical conditions, may proceed upon principles determined by the scientific method of investigation and is more or less mechanistic in its nature. It may be understood also how, through absence of a clear comprehension of the difference between administration and management, and through a failure to distinguish between the nature and technical efficiency of scientific nanagement per se and the administrative problems (social, political and otherwise moral) arising from its use, confusion and controversy have appeared in the public's attempt to appraise scientific management.

Early History: The System.—In 1878 Frederick Winslow Taylor (1856–1915) entered the employ of the Midvale Steel Company as a laborer who had served his apprenticeship as pattern-maker and machinist. He became successively time clerk, lathe gang boss, assistant foreman, master mechanic of repairs and maintenance, chief draftsman and, in 1884, at the age of 28,

chief engineer. From the beginning of this period he was in continual struggle with the workmen to increase output, which he knew from his experience as a workman was extremely low. There developed the anomalous situation, not infrequent in industry of that day, of agreeable personal relations between foreman and individual workmen accompanied by a bitter struggle concerning output between foreman and the workers as a group. Taylor, as foreman, attempted to apply the then customary foreman's method of suasion and force, with the usual result of increasing the bitterness of the struggle. Concluding that he could master the situation only by knowing more than the most skilled workman about the technique of production in the shop, and about what a skilled workman should do, he applied his investigative and inventive mind (he came subsequently to hold over 100 patents) to the problem and began two lines of experiments, which he pursued through many years with great thoroughness and at great expense. One related to the machine, the tool and the material (metal cutting), and the other to the workman's method of handling the machine, the tool and the material (time and motion study). The former line of experiments, continued later at the Bethlehem Steel Company, led to the discovery of high-speed steel and revolutionized the art of metal cutting; the latter line of experiments, greatly broadened, led to the development of a coordinated system of shop management and, ultimately, as an interpretation of that system, to the formulation of the philosophy of management which came to be known as scientific management. The logical anp approximately the chronological steps of the development of the system of management, essential to an understanding of the principles which came to be formulated, were: (1) Experiments leading to dependable knowledge of how long a particular machine operated—or a particular manual process performed by a skilled workman would require to accomplish any specified result, with a given material, according to a specified most effective method of operation, and under specified working conditions. This knowledge, obtained principally by stop-watch studies of unit-time performances, permitted the setting of practicable standards per man-hour or machine-hour higher than the average of current performance. (2) The establishment of a routine of preparation and direction which would insure main-

<sup>&</sup>lt;sup>1</sup> Trans. Am. Soc. Mech. Eng., vol. 27, 1906.

tenance of the conditions under which the standards were set, which led to the working out of such mechanisms as routing, order of work, instruction cards, purchasing materials according to specifications, central stores and controlled conditioning and delivery of materials and tools. (3) The selection and assignment of personnel to machines or operations on the basis of skill and the further development of skill in workers, and (4) the establishment of specialized skilled supervision of workmen to insure maintenance of conditions and to provide instruction. These objects (3 and 4) were accomplished by functionalized foremanship, a gang boss having general supervision of the order of work in the shop, a speed boss supervising the setting up of the machine and an inspector inspecting the product both at the beginning and at the completion of a job. (5) The constant and current checking of progress against standards by cost accounting, the data for which were derived from the operating papers; and (6) of far-reaching importance in its ultimate influence on the managerial attitude of mind, the substitution, in place of the conventional "foreman's persuasion" in securing performance by workers, of voluntary application on the part of the latter through the incentive of a higher wage made possible by the increased productivity. During the years 1891-1900 these gradually developed devices became coordinated into a smoothly working system, in which those supervisors whose duties required personal contact with workers remained in the shop, while those whose duties were in the nature of planning, preparation and control through "papers" were brought together in an office called the "planning room," adjoining the shop.

Later History: The Principles.—The interpretation of this system of management in terms of principles of management seems to have been inspired by Taylor's contacts in the American Society of Mechanical Engineers, which he joined in 1886. In that year Henry R. Towne presented to the society the paper, "The Engineer as an Economist," significant because first directing attention to management as something other than the expression of executive ability, in the assertion that to insure good management there must be joined to executive ability "a practical knowledge of how to observe, record, analyze and compare essential facts in relation to wages, supplies, expense accounts and all else that enters into or effects the economy of

<sup>&</sup>lt;sup>1</sup> Trans. Am. Soc. Mech. Eng., vol. 7, pp. 425-32, 1886.

production and the cost of the product." During the ten years following the presentation of that paper other papers, relating principally to a particular phase of the management problem methods of wage payment—were presented and discussed in the society. Taylor's "A Piece Rate System" is the most notable among these in that he therein described the general system of management which he had developed, arguing that it embodied managerial principles which must be the basis of any sound system of wage payment involving premiums or other differential reward. The title and emphasis of this paper centered attention on his differential piece rate and not, to his disappointment, on the management principles implied. Therefore in 1903 he again appeared before the society with the paper "Shop Management," in which he attempted to direct attention from his piecerate system to what he called a philosophy of management. The body of this philosophy, as presented by him, was essentially the following principles: (1) The objective of good management is the combination of high wages and low unit costs. (2) This objective can be achieved only by the application of strictly scientific methods of research and experiment to the study of the detail problems of management, and (3) the establishment thereby of laws or principles which may be expressed in standards of procedure which give control of operations. (4) The scientific selection of workmen, materials and processes and the establishment of working conditions to meet the requirements of the standards. (5) The scientific training of the workmen to improve the application of their skill in accordance with the standards, and (6) the establishment of such intimate and friendly cooperation between management and workers as to insure a stability of the psychological environment of the shop which would make possible the application of all the principles above enumerated and the utilization of the mechanisms necessary to give them effect.

Recent History: Since the Eastern Rate Case.—Again Taylor's audience in the American Society of Mechanical Engineers failed to appreciate the significance of his contribution. Interest of the members of that society and of the public in general was attracted, not by these serious, scientific papers and discussions, but by sensational testimony concerning the results of scientific

<sup>&</sup>lt;sup>1</sup> Trans. Am. Soc. Mech. Eng., vol. 16, pp. 856-903, 1895.

<sup>&</sup>lt;sup>2</sup> Trans. Am. Soc. Mech. Eng., vol. 24, p. 1337.

management in the shops in which it had been developed, given at a hearing before the Interstate Commerce Commission in 1911, involving consideration of the efficiency of the railroads, and at an investigation in the same year by a special committee of the House of Representatives appointed to investigate, on a petition of organized labor, the effects of Taylor methods at Watertown Arsenal. It was at these hearings and in the title of a book which Taylor published at this time ("Principles of Scientific Management," 1911) that the term "scientific management" was first used. From that time on public interest in Scientific Management was intense and sustained, and discussion of it continuous and occasionally acrimonious, although not always discriminating. Interest and discussion was not confined to the United States, and foreign demand caused the translation of Taylor's papers into French, German, Italian, Japanese, Dutch, Russian and Lettish.

This sudden intensification of interest in scientific management may be accounted for by the fact that in 1911 the industrial community was prepared for such a body of logical and practical management principles, manifested in a comprehensive system of management mechanisms. There had been for a decade a growing general interest in betterment of management. This general interest had vielded improved management devices, such as cost accounting and "systems" of control through "forms" which made more precise, but did not modify to any great extent, existing practice. It had inspired an increasing volume of books and articles concerning special problems of management and descriptive of industrial organizations and procedures which represented the best in existing practice. It had led to books and articles of an exhortatory nature and of stimulating influence, which gave a touch of idealism to the consideration of management problems.<sup>2</sup> But it was not until the Eastern Rate Case of 1911 that interest became widespread and intense. The testimony concerning the accomplishments of scientific management in decreased unit cost and increased profits combined with higher wages appealed to the primary motive of industrial activity: the completeness and coherence of Taylor's system and of the principles which it expressed appealed to the intellect of the serious

<sup>&</sup>lt;sup>1</sup> Interstate Com. Commission Reports, vol. 20, p. 243.

<sup>&</sup>lt;sup>2</sup> EMERSON, HARRINGTON, "Efficiency as a Basis for Operation and Wages," 1909; "Twelve Principles of Efficiency," 1910.

student of management problems; and the very term "scientific management" appealed to the imagination of everyone. The public mind and discussion at once seized upon the term and gave it a generalized application almost as broad as had been represented by the term "efficiency." For that reason students of management must exercise discrimination in distinguishing between the definite, historical meaning and the popular, generalized meaning of the term, and between real, partial and, in some instances, alleged cases of the application of the principles.

Results.—The results of the development of scientific management in industrial plants have not been adequately summarized and presented. Management engineers have been conservative, as a matter of professional ethics, in disclosing results of work in the plants of their clients. Many investigations by others have been vitiated by one of two attending circumstances: Either the investigator has been biased in a desire to find controversial evidence or by a preconceived philosophy of industrial relations; or he has failed to inform himself concerning the history and nature of scientific management, and has been led to investigate plants reputed to have, but really not having, scientific management. The most reliable and complete evidence of results is to be found in the records of the hearings before the Interstate Commerce Commission and of the special committee of the House of Representatives, referred to above, veritable mines of information, and the most satisfactory summaries in articles by C. Bertrand Thompson<sup>1</sup> and Henry H. Farquhar,2 in Brandeis's "Scientific Management and Railroads" (1917), a published part of a brief submitted to the Interstate Commerce Commission, and in the reports of the Chief of Ordnance, U. S. A., 1911, 1912 and 1913. It is the concurring testimony of these several investigations that scientific management reduces unit costs and increases wages and profits, in many instances simultaneously with reductions in selling prices, and that industrial relations with the workers immediately concerned are improved.

#### LABOR AND SCIENTIFIC MANAGEMENT

An almost incomprehensible phase of the history of the scientific management movement is the existence, side by side,

<sup>1 &</sup>quot;The Theory and Practice of Scientific Management," chap. III.

<sup>&</sup>lt;sup>2</sup> Quar. J. Econ., vol. 33, p. 466.

of improved industrial relations in those plants in which Scientific Management has been developed and strong opposition on the part of the management of the American Federation of Labor. The opposition of the management of organized labor seems to have been inspired by fear of the impairment of a fundamental element of their strategy (that their organization must be increased in membership and held intact, for the accomplishment of their larger objectives) by one of the least important mechanisms of scientific management, the differential wage system. Inspired by this fear, and taking advantage of certain opinions held by workers (such as the opinion that increased output will cause unemployment) and certain infelicities of speech and illustration on the part of expounders of scientific management (such as the famous Schmidt Case), and presenting statements concerning the actual operation of scientific management not based on critical investigation and not conforming to facts (that workmen are speeded up and worn out, that time studies are secret, that rates are cut, etc.), the management of organized labor undertook a campaign of education of its membership which resulted in an almost solid opposition by the rank and file as well as the officers of organized labor to scientific management. In public discussion, to the opposition of organized labor was added the opposition of many social scientists who, without information derived from either experience or investigation, asserted that scientific management would make impossible the achievement of any ideal of industrial democracy. Throughout all this controversy the natural confusion of polemical discussion was worse confounded by the absence of critical investigation of facts, inadequate information and particularly by a failure to distinguish, in the discussion of scientific management as a social problem, between management and administration. In this controversy the arguments against scientific management as a system of management technique were ineffective because not supported by the facts; on the other hand, the arguments against scientific management with respect to its social implications were significant and of influence, but they were really arguments concerning administrative policy governing the use of management technique, and not more pertinent to scientific than to any other form of management. Superficial critics failed to perceive the point that the effective working of the scientific management mechanisms in particular depends so vitally upon sympathetic cooperation between planner, supervisor and operator, that antisocial administrative policy is inconsistent with its development and technical effectiveness.

Influence of the War.—The status of scientific management has been profoundly influenced by the war. Three influences are noteworthy: (1) Although the prejudice of workers engendered by the sharp controversy preceding the war has not disappeared. open and active hostility of labor has been discontinued and apparently will not be resumed. (2) The demand for output during the war, supported by labor, compelled a wider extension of efficient production methods, in some instances of the methods of scientific management, not only in the United States but also in Europe, and both labor and management have learned by experience that scientific management technique is not inconsistent with wise, humane and cooperative administrative policies. (3) Labor and management have observed that during and following the war managers of scientific management plants and scientific management engineers have been in the van of those inspiring and directing the establishment of the most humane and cooperative administrative policies, in accordance with the most far-sighted principles of industrial relationship. War seems to have cleared away prejudice and misunderstanding and to have made possible an appreciation of the value of scientific management as an instrument for the increase of the productivity of human effort under wise administration.

## CHAPTER II

## TYPES OF MANAGEMENT<sup>1</sup>

## BY HENRY P. KENDALL

All types of management seem to fall readily under three heads which, for want of a more explicit terminology, we will call:

- I. Unsystematized Management.
- II. Systematized Management.
- III. Scientific Management.

Of course no classification of this kind is exact. Some departments of an unsystematized plant may equal those in a systematized, and, likewise, those in the second class may approach the third in efficiency in places; but on the whole this seems a natural division. The functions of the three types of management which will be compared are:

- A. Accounting.
- B. Purchasing.
- C. Storage of Materials.
- D. Execution of the Work.
- E. Efficiency of the Workers.

### I. UNSYSTEMATIZED MANAGEMENT

This classification is not made on a basis of the earnings of this group, nor does it mean that they are not meeting their own competition successfully or making money. Such a condition depends on the margin which exists between their costs and selling prices. It does classify them on a basis of efficiency, and means that their costs are not so low as they would be were their form of management the systematized or scientific type. In the opinion of the writer, fully 70 per cent of the plants in this country would belong in this class, and they are easily recognized. I do not mean that 70 per cent of the workmen in the

<sup>&</sup>lt;sup>1</sup> Reprinted by permission from "Addresses and Discussions at the Conference on Scientific Management, Oct. 12, 13, 14, 1911," published by the Amos Tuck School, Hanover, New Hampshire.

country are working under unsystematized management, but I think that 70 per cent of the concerns in number would come under this class.

We will look at the first function, namely:

- A. Accounting.—The accounting in a business includes not only the ordinary bookkeeping, but the entire clerical system which has to do with orders, records and costs. Accounting is the only means by which the management is informed from time to time of the condition of the business, the progress it is making, its weak and strong points, its selling values and costs and the efficiency of all its departments. How thorough, lucid and complete the information is as shown by the books indicates to some extent the efficiency of the management and its grasp of the affairs of the company. In the unsystematized plant the accounting generally consists of a statement prepared after the annual or semi-annual stock taking, which shows (1) Profit and Loss: (2) Assets and Liabilities. It may possibly show profit and loss by departments or by products, but this last depends on a correct method of ascertaining costs which the unsystematized plant seldom has. Such statements are merely a record of an historical fact in most cases. If the statement is bad, it is too late to remedy the troubles of the previous year because it shows merely the result of that year. Frequently, due to imperfect methods of stock taking, appraising and compiling, the yearly statement may be delayed; then the history it tells is ancient . . .
- B. Purchasing.—The purchasing of materials, stock and miscellaneous supplies under this type of management may be done by one man or by a purchasing department; but more likely this duty is not very well defined and the purchasing is done by a number of persons, especially those needing the material. Little study is put on the standardization of materials, and different kinds of stock for the same use are often bought. This tends to cause remnants on some kinds, overstock and understock on others. The buying is seldom done on exact specifications, is not always even by written order nor is a predetermined maximum and minimum established of each article that should be carried in stock. The head of the business or the buyer may be an exceedingly shrewd trader and may buy very close at times; but he will not always buy the materials best suited to the work, often overbuys or underbuys for lack of defi-

nite information and is frequently tempted by bargain lots that seem cheap but may cost more to use in the shop.

The lack of well-organized purchasing results in work progressing to a certain extent through the shop until it is stopped and occupies space waiting for some material which has been overlooked, or which is not suited for the purpose . . .

C. Storage of Materials.—Many manufacturers are willing to devote unlimited space for workrooms, not realizing that the room for the proper storage of materials is just as important and just as profitable as that used for manufacture. In the unsystematized plant there may be a general storeroom, but seldom are all the stores to be found in it, and generally they are piled around almost anywhere and in any way that happened to be convenient when received. The order in which such stores are kept usually depends upon the initiative of the men directly in charge, and seldom can one person assume or carry out this responsibility.

The storage of materials and purchasing are very closely related to each other. Loss of time hunting for material is the same whether the material is lost in the storeroom or has not been purchased, and a lack of system in one department will undo attempts at system in the others. The effect of badly organized stores is: (1) Loss of time; work which should go through the manufacturing departments rapidly is held up at different places waiting for materials of the proper kind or amount, and this is a direct loss. (2) Loss of space; more space is required to hold stores in a unsystematized way, and for lack of standardization more stores will be kept on hand than are required. Space is also lost in the workroom, because work in process does not pass promptly through the workrooms if delayed for material. (3) Loss of capital, because more money is tied up in stores which are not systematized and properly regulated, and more money is tied up in the jobs which represent labor and material sidetracked throughout the plant. A lack of proper records of stores is almost always to be found in the unsystematized plant, and the management seldom sees the need for the so-called extra work necessary to conduct that department properly.

D. Execution of Work.—Orders in the unsystematized shop are recorded in a simple manner, sometimes even received and transmitted verbally by the salesman. These are described in part verbally to the superintendent, who may further enlighten the foreman on any of the details of such orders. It is assumed

that the superintendent knows his business, that the foremen know theirs, and a workman is expected to sense what is wanted and to ask questions when he is not sure. In this way an attempt is made to fill the exact and accurate information which the selling end has either not secured or has not transmitted in writing.

The "single foremanship" plan prevails where one foreman handles as many men as he can. The number of men and the amount of work he can look out for is limited by the amount of detail which he can carry in his head and by his physical and nervous endurance. He gives work to each workman when the latter has finished his last job, and depends largely on the worker's knowledge of what to do and how to do it. As questions arise in the progress of the work, or where the written order is incomplete, the workman goes to the foreman, who in turn goes to the office for instructions. Meanwhile progress on the work stops.

The workman goes for and selects his tools and appliances, and does his work in the way in which he is accustomed to do that particular kind of work. A difference in the method of doing the same kind of work by different workmen and in different shops is often quite marked. A detailed schedule of the average workman's day in the unsystematized shop, where such day's work is varied, will show a surprisingly small proportion of effective time.

Piece work is often used, but is bound to be unequal. The rates, determined by no exact method, are often subject to change, and the output of such piece work is frequently limited by the unions. This lack of planning the work at the start, of complete instructions, of coordinating the departments and routing work throughout each operation results in a congestion of unfinished work at many points. This slows down the output, occupies space and ties up capital. The frequency of mistakes in rush times and of shortages that must afterwards be made up are not always called to the attention of the management. It is exceedingly difficult, also, in this type of plant to secure a high quality of work and to maintain it uniformly. Then, too, the costs fluctuate a good deal.

E. Efficiency of Workers.—The efficiency, as a whole, is low, and especially so in dull times. It is uneven and varies according to the executive ability of different foremen. The output of a

man or a machine is largely determined by the opinion of the foreman and not by any exact standard. Piece work is not always fair, and may be too high or too low. There is no special incentive for a foreman to cooperate with the workman. Therefore, while the majority of the men may be doing what they consider a fair day's work, and some few may be working efficiently, the efficiency of the whole is low . . .

#### II. SYSTEMATIZED MANAGEMENT

This term as used here applies to the well-organized and managed plants which make no claim to scientific management as such. In these plants the managers are methodical and systematic, have studied and systematized each department carefully and have aimed to secure the best that has been done in the line of systematizing up to the present time. As stated before, in some departments of many such plants the efficiency is exceedingly good.

A. Accounting.—In this form of management the accounting is well done. The books will show the condition of the business quarterly or monthly, and in considerable detail. This will include the comparative feature; that is, for example, last year's costs to date with this year's costs for the same period, for a given department or product, will show costs of materials and labor, and the proportion of overhead charges that make up the cost of a single job or a given product. Such results may even be charted and shown in graphic form to the management each month. Other records will come up weekly or even daily. As accounting is the means by which the exact condition of the business is ascertained at a given time, the systematized management recognizes the importance of this information. Much of this accounting, however, is done with the ultimate end of securing correct costs, and these cost data are relied upon almost wholly (1) to establish the selling price, and (2) to point out excessive costs and indicate perhaps where they may be reduced. Many believe that when their accounting is well done they have a systematized and efficient plant, but this really covers only one phase of the management.

Frequently, too, the clerical work in the different departments is not a part of the general accounting, and is not controlled by the ledger accounts. In other words, the same general system of

accounting does not permeate the whole plant and help to support itself.

- B. Purchasing.—Materials and supplies are purchased through one man or department, a maximum and minimum generally established and a decided effort made to purchase the materials best suited to the workrooms. Some analytic methods are used in determining the proper materials, and standardizing is done on the more important kinds. This purchasing department aims to have a stock of everything required, but buys largely what it is asked to. It does not always make purchases on complete specifications, and a lack of complete standardization increases the detail of that department. So far as the clerical system is developed, however, it is generally good . . .
- C. Storage of Materials.—A marked contrast to the storage methods of the unsystematized plant will be seen at once. Here is an adequate room in charge of a storekeeper who issues stores only on requisitions, and is expected to keep his place neat and orderly and deliver his stores on call. A perpetual list is kept in the office and balances with the stores, and the balance is proved by an actual count of the stores once a year or oftener. Stores are partially classified and standardized to some extent. It is only the most used stores that are assigned to orders before actually called for. The physical handling of the stores—moving them in and out of the storeroom—is done by the assistants of the storekeeper and the efficiency of this work and the orderliness of the department depend wholly upon the kind of man in charge. The central office can exercise very little real control in this department.

Not all systematized plants control work from a central planning station by writing the operations for each process before the work is started; therefore materials are not exactly predetermined and work is still likely to be started before it is discovered that some material is lacking. Neither are the quantities always kept up automatically through the purchasing department by a predetermined maximum and minimum of each kind. Also, it is general practice to have storage space for different departments, some of which are not under control of the office; for instance, the miscellaneous supplies used by the power department for repairs, piping and plumbing, electrical maintenance, etc. may be scattered about with little idea of order, while the actual materials for manufacture may be in good order.

D. Execution of Work .- A complete set of order cards for recording and transmitting orders is in use. The worker receives a written order for the work he is to do. This seldom takes the form of an instruction card giving him complete information for every move and every tool. It is apt to say what the work is, assuming that he will do it in a satisfactory manner. Workers almost always record their time for each job on a card which registers the labor cost accurately. They do not always register the time lost in securing tools, materials and further instructions. The planning of a job, except in plants where the work is very largely repetition, is likely to be done as the work proceeds. Piece work is used wherever possible, and is considered the most economical way of performing a given operation. It is the aim of most systematized plants to secure as much piece work as possible. This may be unfair for different kinds of work to both employees and employer.

Under systematized management the system keeps things running smoothly, avoids most of the mistakes due to the lax methods of the first kind of management and turns out a good product. But a lack of centralized planning and centralized control of workers causes loss of efficiency.

E. Efficiency of the Worker.—The emphasis of systematized management is laid on costs, freedom from errors and bad work and the greatest output per man and per machine that can be secured. The standard for this output is generally established by the opinions or experience of the bosses, who have neither the time nor the training to ascertain it by exact methods. Great emphasis is put upon the installation of new and modern machinery, but not much analytical work is done by the management to ascertain whether the worker is working in the very best possible way, or whether he is adapted to the particular job he is given. The person who has charge of the employment considers that there are four classes of people—men, women, boys and girls, If the foreman wants a girl, that is sufficient information for the one in charge of the employment, and a girl is hired and assigned. Little or no thought is given to the question whether that particular girl is the right one for the task . . .

The step from unsystematized to systematized management is a difficult one, because it generally means a more radical change in the personnel of the supervisory force than does the other step. The unsystematic manager is likely to associate with him men of a similar type. To do one's work in a systematic way is not wholly a matter of training, and the foremen and superintendents in a thoroughly unsystematized plant cannot always develop the habit of working by means of system. The unsystematized plant still remains, either because its competitors are in the same condition or because there is a large difference between costs and selling price, or because the business is dominated by one or more strong characters, whose ability in other phases of their work more than makes up for their lack in organizing ability. Sooner or later, however, this class of industries will be forced to change or be eliminated . . .

#### III. SCIENTIFIC MANAGEMENT

A. Accounting.—The accounting under scientific management shows the manufacturing and expense accounts for the year by 13 periods of four weeks each, instead of 12 monthly periods, and at the expiration of each of these periods it shows the profit and loss and assets and liabilities. These in the unsystematized plant are shown yearly, and not always in the systematized plant are they shown even monthly. Further, the group and unit costs of the various products, the cost and output of each department and all expenses which might be applied directly to the product are shown in full, and the "comparative" features are much more useful, because four-week periods give a more uniform basis for comparison. A monthly statement as shown by the books in the systematized accounting does not give an accurate comparison, because, for instance, some months will have five payrolls where others have four, and the number of working days varies by quite a per cent, because there may be five Sundays or five Saturday half days.

In substance, the general accounts of the company are shown in more complete form every four-week period than they are by the yearly accounting in the systematized class. The ledger accounts have absolute control over the stores department, over the quantity and value of stores, work and materials in process, and manufactured goods; and as every department and function of the manufacturing coordinates with every other, the accounting becomes a part of the very bone and fiber of the manufacturing.

One radical difference in point of view is that the ascertaining of costs does not have a special system installed for just that purpose, and the ascertaining of costs is not the end sought.

Under scientific management, costs come as a by-product of the means used for increasing efficiency. For instance, a ticket made up in the central planning department, when combined with the instruction card, serves to plan the work in advance; then it is used to control the order of work by being placed on a bulletin board; then it gives the workman his particular piece of work to do with the instructions how to do it. On this ticket is stamped the time at which the work is begun and when it ends. This same ticket then serves to check off the progress of the work on the route sheet. Then it goes to the accounting department, from which the man's pay is made up. It is then redistributed and furnishes the labor cost of the particular operation on the cost sheet of the job. From cost sheets similar to this are summarized not only the cost on all jobs, but also the department expenses and charges which appear in each four-week period statement.

In other words, the mechanism used under systematized management for ascertaining costs performs little other work; under scientific management it has performed its part in producing work, and from it, as a by-product, so to speak, come the costs.

The ascertaining of costs by this method is done with but little more expense than is necessary for handling the regular work of operation. Too much emphasis cannot be placed on the value of the comparative feature in accounting. Comparisons are a great spur to increased efficiency, and this fact is recognized as well in the systematized management. For example: a certain group of department stores, each doing a business in a different city and non-competitive, have found such good results from uniform accounting methods and the information that comes from comparison that they jointly employ an accountant who collects the monthly reports in detail from these stores so as to make a comparison by items, and then prints these data for the use of the management of each store.

For instance, one manager finds that Department A in his store did \$50,000 worth of business the preceding month and had \$35,000 worth of stock on hand, and he is shown in detail what the labor and other expense items of that department were. He sees that another store did \$55,000 worth of business in Department A and had a stock of but \$20,000. He immediately summons his buyer and informs him of the result of this comparison, and asks why he cannot do as well as the buyer in the other

store and release \$15,000 of capital now tied up in stock. The knowledge of what can be done and is done by the other store is often sufficient stimulus in itself to cause the accomplishment of what otherwise would not be considered possible.

The expense, and frequently the shutdowns, for the purpose of the annual stock taking are eliminated under scientific management, because the accounting absolutely controls the movement of materials in and out of the stores department, so its records show at all times the amount in stores and this value can be ascertained when desired. The work of proving the items of stores is done continuously, and the days-which often become weeks and months—that elapse before even large and well-organized concerns get the results of their stock taking become a thing of the past. One large concern, which is a customer in a business in which I am interested, finished its year of stock taking January 1, and it was early in August before it got the results and knew how much stock it had on hand January 1. The same will apply to the amount of materials and labor in process, which the systematized management finds even a harder problem to handle, and also to the value of manufactured goods.

- B. Purchasing.—Scientific management is not satisfied merely to have plenty of materials on hand when wanted, to standardize roughly the principal items of stock used and to buy at the market rate, but demands that all materials be carefully studied with reference to—
  - 1. The greatest adaptability to the work.
  - 2. Quality and uniformity.
  - 3. Price.
- 4. Determination of the proper maximum and minimum that shall be carried, so that the stores department may automatically govern materials and supplies which should always be on hand.

When this has been done, care is taken to make all purchases on detailed specifications. The importance of using materials best suited to the work, and which are uniform in quality and by standardization reduced to the smallest variety, is not sufficiently appreciated by the buyer in even the systematized plant . . .

Scientific methods of purchasing compel the purchasing department to be intimately associated with the working of the materials through manufacture, and result in the following:

- 1. Uniform material best adapted to the work saves labor and delay in workrooms.
  - 2. Minimum of kinds and sizes necessary to be carried.
  - 3. Storage space saved.
  - 4. Lower costs through buying in larger lots.
- C. Storage of Materials.—The physical aspects of a storeroom, under scientific management, do not differ greatly from those in the systematized management. A proper means of holding or piling the stores, laid out in an orderly fashion, is provided. To avoid confusion in a varied terminology, mnemonic symbols are used to designate the different kinds of stores. The maximum and minimum mentioned above are determined for each kind, and kept on the ledger sheets in the central planning room. The bookkeeping for the stores is not carried on in the storeroom, the storeroom force simply acting on orders. The location of the materials is also indicated on the ledger sheets, or, as they are known, the balance of stores sheets.

The storeroom in the systematized plant is not likely to carry all the materials and supplies used in the entire plant. The engine-room, plumbing and construction supplies may be carried in places provided for them, but not controlled as other materials are. Stationery and office forms and supplies may be carried somewhere else under a different system. Even in well-systematized plants, such items as are not considered a part of the general stores system cause more or less trouble by being used up unexpectedly.

Under scientific management it is not sufficient, when materials are required, to send a requisition to the stores department, but all orders or work which require material have the items looked up and assigned to the specific orders by the balance of stores clerks, and this material, when assigned to a given order, is not available for another order which may follow. This is done before the materials are required for use, and this method serves as advance warning to the stores clerks if an unexpected demand for a particular material is likely to occur. Quick action is then possible in purchasing more.

The work of moving materials into the stores department and moving them from the stores department to the particular place where they are to be used, becomes a function of the planning of the work, and of the routing of the work, and the workman who is to use them should not be delayed or have to give a thought to the materials which he needs for his next job. They are moved in the right condition for his use to the point where he can use them to the best advantage. The *time* which the workman spends looking for or waiting for his materials can be better spent in effective work. The proper working of the stores department in many industries, and especially in mercantile establishments, is a very important one.

D. Execution of Work.—The theory of the proper execution of work is that it should be planned completely before a single move is made—that a route sheet which will show the names and order of all the operations which are to be performed should be made out and that instruction cards should be clearly written for each operation. Requisitions on the stores department, showing the kind and quality of the materials and where they should be moved, and lists of proper tools for doing the work in the best way, should be made up for each operation, and then by time study the very best method and apparatus for performing each operation is determined in advance and embodied in the instruction.

By this means the order and assignment of all work, or routing, as it is called, should be conducted by the central planning or routing department. This brings the control of all operations in the plant, the progress and order of work, back to the central point. Information, which even in the systematized plant is supposed to be furnished by the knowledge of the workman or the gang boss or foreman, is brought back to the planning room and becomes a part of the instruction card.

In many unsystematized plants no attempt is made to change the method by which the workman performs his operations. Plenty of time and money may be spent on special machinery, but when that is installed very little time is spent in a close analytical study of the time elements and motions involved in operating, in order to make it possible for the workman to work in the easiest and best way and to furnish a fair basis of remuneration.

When the analytical study has been made, the probable time of operation determined, and a sufficient incentive added, in the shape of a bonus, for performing the work in the given time and in the way specified, then work can be much more accurately controlled from the central planning room, because it is likely to be done in approximately the time determined and without lagging.

By functional foremanship the management brings to bear on each phase of the work a man particularly fitted by selection, training and experience to assist in performing that part of the work. His function is to assist the worker and cooperate with him to enable him to increase his earning capacity by eliminating trouble or delays or wrong methods. Even in the well-managed systematized plant the manager will tell you that the weak point in his business is the inability to secure good foremen or good superintendents. He demands:

- 1. That the foreman shall know all about the work which is done in his department.
  - 2. That he be a good disciplinarian.
- 3. That he have the ability to crowd work through and get it out quickly.
  - 4. That he be cautious and accurate.
  - 5. That he be able to keep account of innumerable details.

To find all these qualities combined successfully in one man is exceedingly difficult, to train such men is also difficult and to secure them by natural selection and "survival of the fittest" takes too long; but to train men for functional foremanship by selecting the best man fitted to do the particular function, and then training him in that, is simply one kind of division of labor which has marked the progress of civilization.

The execution of work which is largely repetition, where the individual processes are simple, reaches a very high efficiency in many systematized plants. The difficulties in securing efficiency increase as the work becomes more varied and with a smaller amount of it repetitive, and in proportion as these difficulties increase ordinary systems fail to produce results in more intricate work. This can be attained, however, by the central planning room, from the analysis and time study which is put into all operations of work, and reduced to instruction cards.

E. Efficiency of the Worker.—On many simple operations in manufacturing, piece work has always been considered the most efficient method of securing output and low costs, and it is true that where the remuneration is a just one and when the employee is supplied with proper materials and works to the best advantage, this method of performing work approaches very close to that of scientific management, but such conditions of piece work are the ideal rather than the usual. As stated above, piece work, with prices based on the snap judgment of a foreman or by an

imperfect test of a single worker, is not the correct method for securing the greatest efficiency. Besides this, there are many kinds of work which are not adapted to piece work. Under scientific management the efficiency of the worker and machine depends on five other conditions, after assuming that the parts of the management which have to do with purchasing, storage of materials, etc. are well performed. These conditions are:

- 1. Analysis and synthesis of the elements of operation.
- 2. Scientific selection of the worker.
- 3. Training of the worker.
- 4. Proper tools and equipment.
- 5. Proper incentive.
- 1. Analysis and Synthesis of Elements of Operation.—The first condition on which the efficiency of the worker depends is that the management shall analyze carefully and thoroughly every operation into its ultimate elements; shall then reconstruct those elements in their proper sequence, eliminating those which are unnecessary or those which are bad, and reducing the form to a written instruction card for him to follow; the time elements, having been determined, become a part of the instruction card...
- 2. Scientific Selection of the Worker.—The type of worker who, physically and mentally, is best fitted to do a kind of work must be selected after a careful analysis of that class of operations, made with reference to physiological and mental differences in human beings . . .

Scientific selection of the workmen is but a part; the scientific selection of foremen, of superintendents and managers is just as important. How frequently one sees a man struggling with the details of an office or with the wear and tear of executive work, on the verge of nervous prostration, when that man is wholly unfitted for that kind of work and his attempts successfully to perform it result in his undoing. If managers themselves knew how to judge a man's fitness for his work and were more observing, there would be many less breakdowns and physical wrecks than there are now.

3. Training of the Worker.—Having first carried out the study of the operation, which has pointed the way to the proper selection of the worker, it becomes the duty to train the worker to do the work in the way which the result of the analysis has shown to be the best way. This will be accomplished by a functional

foreman, whose duty it is to train the workmen and help them to get started right on each job. If they fail to do the task in the time fixed, it is the duty of the functional foreman to find out why they have failed, and to help them do the work as it should have been done. This is a wide departure from the old school, which assumes that the journeyman has sufficient knowledge to do his own work in the most efficient manner. In the training of workmen it is interesting to see how they develop through an aroused interest and cooperation of those over them.

- 4. Proper Tools and Equipment.—The fourth condition is that the worker be supplied with the best tools and just the ones needed for the particular operation, and supplied when needed; that he be given the best machine, maintained in first-class condition, so that machine, belt and tool failures will be reduced to the minimum. To maintain the machinery, etc., in this condition is a duty of the management, and scientific management provides the means with which to do this.
- 5. Proper Incentive.—Sufficient incentive should be given the worker to perform the operation or the task that has been set in the given time. To make this possible for the worker, functional foremanship is necessary and the principal object of such functional foreman is to assist the worker and eliminate trouble or delay. The functional foreman trained to his specialty will do this more effectively than the old-fashioned allround foreman . . .

It must be to the financial interest of the worker to be industrious, and it has been shown to be for the interest of the management to do everything to make possible and profitable this increased industry of the worker, thereby gaining a more uniform output, and an output per man or machine which is maintained more uniformly in dull or busy times.

There is another feature which is of interest; that is, if the worker engaged on the task and bonus does not receive his materials promptly and on time, if his machine is not in the condition it should be in, or there are other avoidable delays, the worker has sufficient interest in the probable loss of his bonus to make a serious kick, and it is the duty of the gang boss to right this trouble immediately. Therefore, the workman and the boss are together demanding of the management that as nearly as possible perfect working conditions be maintained.

#### IV. CONCLUSION

The central planning and control of work which are such vital parts in scientific management are not developed to the same degree in systematized management. In systematized plants where complete planning is attempted, however, the instructions and orders particularize what is to be done rather than how it is to be done.

In the systematized plant the system in one department has been planned especially for that department, and is not a part of the system framework which pervades the whole, as in scientific management, and it is a constant fight to maintain such independent systems and especially to change and modify them with changed conditions or the increased growth of the business.

In closing, let us see the effects of this type of management in general on the plant, the product, the worker and the management.

Plant.—Scientific management furnishes the machinery for maintaining the plant in better condition by centralizing the control, by the use of such devices as the standing order file, in which are collected and reduced to writing and properly indexed the practices and rules of the company. From it, by listing and making a certain program of things to be done—the departments, machinery, shafting, drains, gutters, etc., to be inspected—this program can be handled month after month by routine in a manner which the management has carefully predetermined. To attend to the maintenance of a plant in this way is working to prevent delay and expense rather than to cure it afterwards. For instance, eliminating delays due to belt failures, shaft boxes which have been overlooked and run dry, and indefinite inspection of premises, pipe lines, traps, etc. tends to save expense by preventing trouble.

**Product.**—The product of such a plant should be more uniformly even, and there should be fewer mistakes and less inferior work. Once a standard is set for each operation, that standard can be maintained. It costs little more to maintain a high standard under these conditions than a low one under old conditions.

The Worker.—The condition of a worker's mind has a very large effect on his physical being. There is a psychological effect on a worker in having the work divided into definite tasks, each one having its goal in sight and sustaining effort to that end . . .

Management.—It is probable that the point of view of heads of departments and those responsible for the management becomes quite as much changed as that of the workers. When mistakes are made the responsibility is fixed and the management cannot dodge the fact. A manager also realizes as never before the value that must be placed on analysis. As Mr. Taylor once said: "Thought under scientific management is 75 per cent analysis and 25 per cent common sense."

When a seemingly difficult operation has been analyzed to its last detail, it is not so difficult to reconstruct it on the proper lines. There is, too, an added interest to the management in the feeling that it is working on a plan, the underlying principles of which are already determined, and the details of which are to be developed in accordance with those principles more and more finely as years go by . . .

Beneath all this there is a good deal of philosophy. It seems to me that this is the best solution of a fair compensation for labor, because it puts a premium on the efficiency of both employees and employer, and the success of scientific management depends upon this close cooperation of employer and employee. Along some such line it seems to me the great problems of labor and capital will sooner or later be worked out.

## CHAPTER III

# THE CONTRIBUTION OF SCIENTIFIC MANAGEMENT TO INDUSTRIAL PROBLEMS<sup>1</sup>

BY H. S. PERSON

The time has not come for a definite statement of the contribution of scientific management; in fact, that time may never come, for industrial problems are continually changing, and with each change scientific management has something new to contribute. It is today contributing more to the solution of industrial problems than at any time in the past, and it seems certain that a decade from now the evidence of its influence will be still greater.

It should be borne in mind that no one prior to Taylor had enunciated a logical and comprehensive philosophy of management, and devised a system of operations to give any managerial philosophy and body of principles a concrete expression: therefore any theories and mechanisms of management existent today, which conform to those of Taylor, may be attributed to the influence of his exposition. It should be borne in mind also that Taylor too modestly declared that the elements of his system were not original with him: that he had merely taken them from here and there, put them together into a purposeful relationship and given them a new meaning. We say that the Wright brothers invented the aeroplane, but when we examine the parts of the original aeroplane separately we find nothing which did not exist before; what the Wright brothers did invent was a new combination which would accomplish a new purpose. So it was with Taylor's discovery or invention or formulation of scientific management.

Science and Industry.—The fundamental element of Taylor's philosophy of management is that the solution of the problems of management must rest on a factual basis and that tradition, guess and prejudice must be eliminated. That is an axiom of industry today, although practice has too little accompanied preachment. Perhaps the next most fundamental element of his philosophy is that the factual basis must be determined by utilization of all the apparatus of investigation furnished by science (hence the

<sup>&</sup>lt;sup>1</sup>Reprinted by permission from the Bulletin of the Taylor Society, June, 1923, vol. 8, No. 3.

name scientific management), and today as never before industry is using the approved methods of science, experimental and statistical. Another element of Taylor's philosophy, derived by his scientific investigation of his problems, is that, when a large number of people are working together at specialized tasks for the accomplishment of a common purpose, these specialized tasks group into two grand divisions, each of which requires a special temperament and skill. One is the group of specialized tasks pertaining to planning and preparation; the other the group of tasks pertaining to detail execution. For the segregation of the first of these groups he devised the planning room, where what, how and when should be taken care of; and today in industry an establishment without a planning room is very much of a back number. Organized labor has been known in some of its controversies to make much of the point that the particular employer is so inefficient in management as not to have a planning room, with the result that jobs do not come through regularly, materials are not always available and, in general, there is "unemployment within employment." There are even signs that workers are coming to recognize the value of the stop watch as an instrument of investigation "when properly used"; and one of my most interesting experiences was the appearance in my office one morning of an industrial engineer and a secretary of a local, inquiring if the Taylor Society could furnish a stop watch—they "had been looking all over the city for one"; were "in a hurry to make some investigations in order to confront employers at a conference with facts." Leaders and advisers of organized labor, in sufficient number to be significant, are coming to the point of view that the establishment of a standard time in which an operation may be performed will eliminate one of the guesses on which wage rates are based, with a consequent nearer approach to stability of conditions, rates and workers' income . . .

The Taylor principles and system of management, as first presented, were concerned principally with *shop* management; it is natural, therefore, that their greatest contribution should have been towards better factory management. But not less significant, although at present less extensive, has been their contribution towards better management of an enterprise as a whole; better definition of the purpose and policy of an enterprise and better coordination of the major departments—selling, production and finance.

Management of the Enterprise as a Whole.—It has occurred to some managerial minds that the problems of the enterprise as a whole are similar in broad outline to the problems of the shop, but on a greater scale. Just as shop management may bring specific orders, jobs, workers, machines and materials into a harmonious and economical relationship, mutually profitable to employers and workers, so the management of the enterprise as a whole may bring orders in mass, workers in mass, materials in mass, and equipment in mass into a similar harmonious and economical relationship, mutually profitable. The decisions pertaining to the enterprise as a whole, like the decisions pertaining merely to the factory, should and may have a factual basis; that factual basis should and may to a considerable extent be determined by the methods of science; even the major specialized tasks of management of the enterprise as a whole may be grouped into two grand divisions—planning and preparation on the one hand, and execution on the other. There should and may be a superplanning room for the enterprise. Therefore, the development of sales engineering and market analysis, the formulation of budgets, master plans and schedules of sales, finance and production, and consolidated reports of departmental progress to check against these plans, just as in the shop there are now schedules and progress reports.

Now this is a matter of utmost importance. Wise managers and wise workers should strive for stabilization of the operations of an enterprise. It is not sufficient merely to stabilize the operations of the shop when there are orders (this is what scientific management in its early developments has accomplished); it is even more essential to stabilize the business and assure a predetermined regular flow of orders (which is what scientific management in its later developments is accomplishing in a number of enterprises). This is true for several reasons, two of which stand out: Regularity of employment and income to workers and of profits to employers is more essential to human comfort than mere occasional economy resulting in occasional high wages and high profits: also regularity of orders, processing and employment has a great deal to do with detail economy, high wages and good profits. Scientific management has reached into the field of general management as a matter of necessity—it was inevitable. For as soon as it had taught managers how to develop the shop management of least waste, with its better wages and better

profits, it realized that this management is dependent upon continuous performance; therefore, with the vision and persistence of Taylor, his managerial descendents have not hesitated to carry their principles into the field of general administration. If the reader should make two lists of enterprises, one of plants in competitive industries which have maintained reasonably regular operations and employment during depressions, and another of plants which are generally identified as Taylor plants, he would be astonished at the similarity of the two lists.

Management of Industry as a Whole.—Scientific management has made its influence felt on a still higher plane. The administration of the Department of Commerce has been endeavoring in many new ways to assist American industry. One was the appointment of a committee to investigate the extent of and the reasons for waste in American industry. The report of the Committee on Elimination of Waste in Industry is considered a most important public document; it was hailed by organized labor as one of the most important documents in their interest ever published—for it publicly placed the chief responsibility for waste on management. That committee was composed largely of Taylor engineers, its point of view was entirely Taylor and the standards by which it judged waste were the standards. simon-pure, of scientific management. The campaign of the Department of Commerce for simplified commercial practice (standardization of products within a trade) is the application in a large way of the good old scientific management principle of standardization of the products of the individual shop as an individual measure of economy.

The outstanding contribution which scientific management is now making is to the solution of the problem of industrial relations. During the past four or five years many theories have been advanced concerning the problem of industrial relations, nearly all of which have not found and could not find practical expression; many specific things have been attempted which have proved insufficient because they have not taken into consideration fundamental facts of human nature and of industry; now a tendency is evident to turn for solution to the one thing which in individual plants has shown a large measure of success—management on a factual basis; in other words, scientific management.

There are many, both workers and managers, who believe that the only practicable means of settling industrial disputes is through strikes, lockouts, jockeying in conference, temporary compromises and so on, even though they recognize that these things are wasteful and costly to both sides. But there are others, both workers and managers in increasing number, who feel that the number of controversies would be materially reduced, if all the essential, indisputable facts concerning the situation which have given rise to a dispute could be laid on the table in negotiation, or even informally reviewed by representatives of both parties before the stage of formal controversy and negotiation is reached. When leaders of the two sides to a potential controversy approach each other with this common mental attitude, begin to consider the details which have contributed to the unfavorable situation, endeavor to get at the real facts, inquire into the conditions of the business and of the management and finally attempt to formulate constructive remedial measures, it is found that these remedial measures have to do with the administration and management of the enterprise, and are in spirit and in technique essentially identical with scientific management.

"Industrial relations" connotes relations in the conduct of enterprise; relations with respect to policies, plans and their execution. These relations pertain to no one thing, but to everything in the enterprise; they are found in no one spot, but everywhere in the enterprise. They are as long, as broad and as deep as is management. The problem of industrial relations is a problem, the problem, of management. A personnel department may perform many useful specialized functions; but it should always be borne in mind that everyone in the enterprise is responsible for a personnel function; that the entire enterprise is the real personnel department. Problems of industrial relations arise out of the policies adopted by owners and general management; out of the nature of general plans and schedules; out of the detail plans, schedules and standards established by the planning room; out of the conditions of work, nature of the equipment and nature and adequacy of the materials provided; out of the conditions of employment and the wage rates which are established; out of the mental attitudes and specific conduct of executives and foremen. The diagnosis of a situation which offers a potential controversy must be a diagnosis of the methods of management; the remedy must be practical measures for improvement of the management; and those practical measures which most frequently improve the management in such a way as to remove the unsatisfactory conditions are found to be measures which express the principles of scientific management . . .

Conclusion.—It is my own conviction that at some future time, when the development of scientific management can be reviewed in proper perspective, its greatest contribution to the solution of industrial problems will be discovered to have been this: That at a time when American industry was dominated by ideals which made management but a game of chance, of trading in natural resources, growing markets, materials, equipment, processes, workers and equities, with now profit and now loss-that in the midst of an industrial society with such ideals Taylor injected the concept that a business should exist for social service, that its purposes can be defined, its objectives planned and scheduled, detailed execution be so controlled as to contribute most economically to the final result and that the final result can be a productivity of useful things so shared as to increase the comfort and promote the happiness of all concerned. In short, the Taylor philosophy of management first gave logical and coherent expression to the ideal that business should be an aggregate of processing enterprises instead of an aggregate of speculative enterprises, and his system of management pointed the way to the technical accomplishment of that ideal.

Most of our industrial problems are the consequences of conduct which expressed the point of view that business is a speculative enterprise, a point of view which has by no means disappeared. The remedy is to substitute conduct which expresses the point of view that business is a measurable, controllable processing to meet a social need. To the extent that such a substitution is made will industrial society increase its demands upon scientific management.

I believe the day is not far distant when organized labor will be the principal proponent of scientific management. It will insist that the enterprises in which it participates shall cease to be speculative and shall become stabilized processing activities; and when it has so insisted, and has been countered with inquiry as to how that is to be accomplished, it will—whether it uses the term or not—recommend the methods of scientific management.

#### CHAPTER IV

## POSITIVE CONTRIBUTIONS OF SCIENTIFIC MANAGEMENT<sup>1</sup>

BY H. H. FARQUHAR

#### I. CONTRIBUTIONS

In setting down as impartially as I can what I believe to be the principal contributions of scientific management it would, of course, be folly to claim any monopoly of effort along constructive lines for the movement as a whole or for any business operating under its principles. These cases are simply illustrations of what may be accomplished by a policy of consciously and continuously taking thought of the numerous economic and social factors which make for permanent success, and of coordinating these elements into a rounded, balanced management.

A. Original Contributions.—The outstanding accomplishments of Mr. Taylor and his associates are well know and require only a reference. His revolutionary invention of high-speed steel has had a profound effect on all metal-cutting establishments; as a result of long investigation we have the standard shapes of tools which are in everyday use in all well-run shops today, the marvelous slide rules devised by Mr. Barth, and the modern automatic tool grinder. As part of his early work also came the standardization of belting care and maintenance which constitutes best practice up to the present time. The present sharp line which well-run plants draw between planning and performance is a direct outgrowth of his later work. His instructional or functional form of organization, found in such wide use today, is a direct heritage from his early insistence on making the work of the management more effective. Over thirty years ago he devised a cost system which, with slight modifications, has not suffered in comparison with the best that we have at present.

Some of the significant contributions, as outlined in a paper by the present writer in 1919,<sup>2</sup> will be briefly summarized, but

<sup>&</sup>lt;sup>1</sup>Reprinted by permission from the *Bulletin of the Taylor Society*, Feb., 1924, vol. 9, No. 1.

<sup>&</sup>lt;sup>2</sup> Quar. J. Econ., May, 1919, reprinted in Bulletin of Taylor Society, Oct., 1919, vol. 4, No. 5.

reference must be made to that paper for a more extended discussion of each of these contributions than is possible here.

1. The Mechanical or Impersonal Aspects. (a) Increased Production.—By far the most striking single fact as regards the results of scientific management is the very considerable increase in production it has effected with the same equipment and personnel. And this result has not been always secured, as might be assumed, from plants that were near the lower level of efficiency before the development took place.<sup>1</sup>

Of the various means by which scientific management increases production and decreases cost, some—such as the selection, fitting and training of the workers, the reducing of labor turnover, absences, lates, etc., the determining and securing of a proper day's work and the paying of a correspondingly increased wage—are distinct economic gains in themselves. These will be indicated under the human factors. Others, however, only indirectly related to questions of personnel relationship, merit mention here. Among the most important of these are:

- (1) The more effective utilization of equipment, a use greatly stimulated by Mr. Gantt's admirable idleness charts showing as accurately as may be the cost of each different kind of idleness.
- (2) The more effective use of labor through scientific man and job analysis and the devising of better methods of work.
- (3) The strict regulation of materials through simplification and standardization, and through methods of control of material activities.
- (4) More accurate *routing*, including both the physical layout and the administrative control of work in process.
- (5) And, finally, the regulation of industry. Perhaps nowhere better than in the elimination of seasonal production and its attendant evils is the fact illustrated that what is of permanent benefit to the management also benefits the workmen and

<sup>1</sup> Besides the desire for increased production there has also been the determination to establish a more scientific and therefore more lasting basis for the management of industry, and to bring about better industrial relations. When speaking of increases in production, it must be remembered that a simple increase in production, with accompanying decrease in a cost which was hitherto higher than it should reasonably have been, is not entirely satisfactory—it is only erasing the negative and getting back to par, as it were, but failing to add a plus. Where the increase in production and the decrease in already reasonable cost go hand in hand, however, as is characteristic of plants run under Taylor principles, the gain is direct and indisputable.

vice versa. That seasonal variation in many cases is not a unpreventable waste has been amply proved by those industries which have attacked and eliminated the evil.

- (b) Improvement in or Maintenance of Quality.—Scientific management has conclusively shown that, as between speed and quality, there is not only no intrinsic irreconcilability, but, indeed, that with intelligent handling an improvement in quality has usually accompanied increased speed. Just why this is so may be left largely to the psychologists—we are dealing simply with the abundantly proved fact.
- (c) Speedy Production and Accurate Delivery.—The firm which can accurately predict and rigidly maintain delivery dates is not only in an enviable position from the buyer's standpoint, but may claim a distinct contribution to itself, to the buying public and to the community at large. This control, characteristic of the properly managed plants, constitutes a decided antidote to the tendency for ever-increasing costs of living.
- (d) The Power and Stimulus of Knowledge.—As a final consideration under the industrial or non-human aspects come the confidence, the sense of security, the power and stimulus which spring from the knowledge that we have real control of our business through the ordered regulation of its activities according to adequate knowledge and best practice.
- 2. The Human Factor.—Important though it be for the country at large that we have high production and low costs, that we establish a strong industrial basis, it is of greater importance that while we are making things we do not forget that our first and infinitely more important duty is the making of men—making good citizens.
- (a) Industrial Peace.—The fact seems to be that in scientifically managed plants there has been remarkable freedom from the turbulent and distressing manifestations of industrial maladjustments characteristic of the last few years. This absence of labor trouble is due undoubtedly to a combination of causes; to a spirit of cooperation—the "mental revolution" which is such a vital part of scientific management; to fair dealing; to a proper work environment; to a spirit of democracy; to increased individual production; to high wages unaccompanied by over-exertion; and to a feeling on the part of the employee that his best interest is being and will be looked after. It is due, indeed, to all these factors; it is inclusive of them all.

This fact is of preeminent importance at the present time. The bringing about of industrial peace in its establishments is unquestionably the greatest contribution of scientific management.

(b) High Wages.—Increases in the earnings of operatives working under scientific management are too common and well

known to need repetition.

- (c) Proper Working Hours.—Mr. Taylor was one of the first to recognize and to prove the fact that overlong working hours are not conducive to high output, and that in very many cases hours of work may be sharply decreased to a certain point and output increased simultaneously.
- (d) Conditions of Work as Related to the Health and Wellbeing of the Worker.—Looked at from the entirely personal, selfish, financial aspect, there can be no question that the very best condition of the employee is the very best condition for the owner of the business. That the owners and managers of plants under scientific management primarily and continuously have the best interests of their people at heart—not from any ulterior motives, however, but because they are "that sort of person"—I believe can be doubted by no one who will take the trouble to visit them and their employees.

There is another phase of this question, however, which is of much greater importance in that it affects the workman during his entire life as a productive member of society. This is the determination, through time study and allowances for rest and necessary delays, of "the best day's work that a man could do, year in and year out and still thrive under." It is significant that the first "fatigue study" ever conducted in a really scientific manner, so far as the writer's records show, was performed over thirty years ago by Mr. Taylor as a part of his determination of a proper day's work.

In spite of the oft-expressed fears that the so-called "speeding up" would result to the immediate or ultimate detriment of the worker, no authentic case of anything but beneficial results of high individual production has been brought to light.

(e) Selection, Fitting and Training.—It would be difficult to overestimate the advantage both to the individual and to the nation of a condition where each person could be engaged, under conditions satisfactory to him, upon work for which he is naturally best fitted.

In plants run under scientific management, committed as they are from early days to a policy of "scientifically selecting, training, teaching and developing the workman," it is the customary thing to find operatives who are now doing excellent work on their third, fourth or even fifth trial after having previously been unsuccessful at work for which even they originally thought they were best fitted. We naturally expect to find, and do actually find, numerous cases of promotion from the ranks.

(f) Free Scope for Individual Initiative and Opportunity for Advancement.—The criticism has been made that in working under the highly standardized conditions and detailed instructions that scientific management insists upon, there can be little chance for the exercise of one's individuality. This accusation is true in that we do not let a novice tamper with a new and delicately built mechanism until he proves that he has mastered it.<sup>2</sup>

It is not individuality and initiative run wild which is really constructive; it is intelligently applied individuality, and prerequisite to this is an understanding of things as they are and how they have come to be what they are.

So far from killing the right kind of initiative, scientific management plants are promoting individual initiative in the truest and highest sense—the initiative of the enlightened type of workman. The oft-quoted criticism that, under scientific management, the worker's job is monotonous overlooks the fact that monotony is due not so much to the unvarying repetition of recurrent operations as to the accompanying feeling that the work holds no future possibilities. The consistent policy of promotion from the ranks has done much to make every workman

¹ Starting with the original instructional foreman inappropriately called the "Disciplinarian," now developed into the modern functionalized Employee's Department (known variously also as the Personnel Department, the Labor Department, the Employment Department, etc.), there is set up not only a means for bringing to pass such conditions as those described above, but also the means to establish and maintain a more intimate personal touch between management and men, and to sit in judgment over the employee on the one hand and the management on the other—acting as buffer, as it were, between the two. The very recent widespread adoption of this safety valve is a decided step in the right direction.

<sup>2</sup> As Alexander Meiklejohn says ("College and the Common Life," *Harper's*, Nov., 1923): "Let it be understood among us that no man has a right to any opinion on any subject unless it rests upon the best thinking

which we have upon that subject."

feel that he has a marshal's baton in his knapsack. Instructional (or functional) foremanship opens up avenues for advancement to others than the exceptionally gifted workman.

- (g) Reduction of Labor Turnover.— Much of the restlessness in industry is curable. It is caused by the existence of unsatisfactory conditions in just those features of management discussed in the preceding topics—too low wages, long hours, poor working conditions, lack of proper selection, fitting and training, and a conviction on the part of the employee that for him his present job in his present place offers no future. Naturally, therefore, with the removal of the causes in any particular place the evil itself largely disappears. This has been the experience in numberless plants which have adopted advanced measures more or less completely.
- (h) Spirit of Cooperation and Confidence and Feeling of Security.—As a result of all of the positive products of advanced management enumerated above come the last and most important of them all. Indeed, so important are the spirit of cooperation and confidence and the feeling of security on the part of the whole personnel that nothing should be allowed to undermine them; for without them, although a certain efficiency may be obtained, true scientific management is impossible.

Cooperation may be obtained only by securing the confidence of those with whom we deal, and this confidence, in turn, results only when each man feels secure in the belief that he is in the best possible place for him and that he need have no fear for the future so long as he fully plays his own part. Only when the management really assumes its full share of the work and the responsibility may his confidence be secured. And only through making this security and this confidence an actual fact has scientific management been able to produce what it so highly prized and what it has so remarkably obtained—true cooperation.

- B. Refinements in Technique.—There are some significant advances which have been made during the last few years which can be referred to only briefly. Since progress has been rapid and widespread, the following list of accomplishments must necessarily be incomplete.
- 1. Cost Methods.—Mr. Taylor's early work set up admirable means for the collection of costs and the distribution of overhead

expenses.¹ Mr. Gantt emphasized strongly the desirability of ascertaining that part of the expense of operation which was due to idleness of various causes. The result has been that in the last few years much attention has been given to the establishment of "standard costs" or standard rates for overhead distribution. In fact, I question whether the pendulum has not swung too far in this direction in that the actual cost is too often disregarded by simply taking the difference between actual and standard directly to Profit and Loss. I feel that Mr. Taylor himself would have heartily approved of setting up a normal or standard overhead rate, but that he would have most emphatically condemned our using the resulting theoretical cost figures alone without being able to compare them with the facts—the actual cost of the product, including all expense of turning that product out.

2. Organization.—What seems to me to be one of the really significant developments is that made by the Joseph & Feiss Company in functional organization. Among other valuable features, this organization is tied absolutely to the cost classification, so that the expense of performing each function is definitely tied to the man responsible for that function.

3. Fatigue.—The publication in 1917 of Merrick's articles on "Time Study for Rate Setting" (followed later in book form), with the fatigue allowances presented, can by no means be overlooked as a distinct addition and extension of Mr. Taylor's pioneer work in the study of rest and delay allowances.

4. Executive Reports.—Much remains to be done in the field of executive reports, both as to subject matter, form and period of time covered. There are two noteworthy developments which must be mentioned here: one, the admirable administrative guide, called the "progress chart," devised by Mr. Gantt; the other, the advanced thinking presented in the chapter entitled "A Technique for the Chief Executive," by John H. Williams.<sup>2</sup>

5. Control.—We are familiar, of course, with the refinements of control worked out by Mr. Barth and Mr. Babcock at the H. H. Franklin Manufacturing Company. I am not sure that the

<sup>&</sup>lt;sup>1</sup> This distribution was such as to load all expenses of running the business during a given period on all products made during that period, the variations from period to period being ascertained and watched by means of shop and general expense rates worked out currently.

<sup>&</sup>lt;sup>2</sup> See Chap. VI, p. 78.

latter gentleman has not at the Holt Manufacturing Company out-Babcocked himself in securing a degree of control that seems to come pretty close to the ultimate goal. With Mr. Babcock's permission I quote from a statement on this subject which he gave me under date of December 29, 1923:

A significant fact which should be noted in connection with the results of scientific management at this plant is the absolute control and regularity with which our product is produced. For a period of 496 working days, starting with March 13, 1922, up to the present time, our shops have not failed in one instance to bring through exactly the number of units of product which were scheduled to be finished on each of the 496 working days.

- 6. Adaptation of Methods.—As is pointed out later, one of the most serious shortcomings of which we as a group are guilty is an overreadiness to accept as suitable, under a wide diversity of conditions, methods which have proved satisfactory in one or more instances. I am glad, however, to record the fact that a distinct advance has been made in the last two or three years; first, in analyzing the particular situation in hand, and second, in devising methods to meet that situation.
- C. Application to Broader Fields.—This record would be incomplete without referring even very briefly to the significant extension of Taylor principles to fields outside of production proper. Probably as fine an example of scientific management as we have today is to be found in the non-selling departments of the Jordan Marsh Company of Boston, Massachusetts. Should the reader have an opportunity to investigate that development I am sure that he would be struck with the extent to which the principles, and even the detailed methods, with which he is familiar in a factory, have been applied to a department store. The work which has reached such a high plane in this firm is being extended in several other similar establishments. Similarly, the managements of general offices in manufacturing plants and banks, etc., particularly as regards layout and office procedure, are being reorganized in several instances in accordance with the principles found so effective in the factory.

It would be impossible in the space available to give due praise to the splendid development of the principles and methods which

<sup>1</sup> See Management and Administration, June, 1924, where Mr. Babcock reports that for 600 consecutive working days the production of the factory has exactly equaled daily the schedule of programs laid out not less than four months preceding.

such firms as the Dennison Manufacturing Company and the Joseph & Feiss Company have made in the selling ends of the business. I believe the leadership which a few of these firms are showing in the field of distribution is destined to have a profound effect on American industry.

A significant line of development also is experienced in the maintenance department of a large eastern mill. Gratifying savings in the cost of actual repairs as well as freedom from breakdowns have been made through careful inspection, through standardization and advanced planning of all maintenance work so far as it can be foreseen, through elementary time study and through the payment of bonus.

Reference should here be made to the widespread adoption of budgets and quotas as simply an extension of the general principle laid down in "Shop Management," of setting up standards and of measuring actual performance (whatever form it may take) against such standards.

Reference has been made to the early efforts of scientific management plants to regularize production. It is gratifying to note that these attempts have been followed up and extended to cover the span of the business cycle.

Following the extension of the principles of scientific management to the selling end of several businesses has come the effort, as yet scarcely under way, but destined to receive increasing attention, to raise the level one stage higher by extending the same principles to the control of the total activities of the business. This attempt to coordinate sales, production and finance, coming to be known as "master planning for balanced management," is occupying much attention today in progressive firms.

D. General Influence on Industry.—Mr. Taylor as early as 1895 said:

This system of management will be adopted by but few establishments, in the near future at least, since its really successful application . . . involves such thorough organization that . . . but few manufacturers will care to go to this trouble until they are forced to . . . . <sup>1</sup>

Although this prophesy regarding the number of establishments has been borne out, nevertheless the influence of Taylor philosophy on industry has been tremendous. Many organizations which would be very loath to admit it show unmistakably the influence of this movement. The growth in numbers of

<sup>1&</sup>quot;A Piece Rate System," par. 89.

really scientifically managed plants has been slow, but, what is of much more importance, there has been a growth, and this growth has been entirely healthy and permanent.

- 1. Although some other "philosophies" of management can claim many more original converts, nevertheless the plants which have really achieved true scientific management almost without exception are running along as merrily today as they were five, ten or twenty years ago, while the examples of these other systems existing today are exceedingly rare. The object lesson of this permanence resting upon thorough conversion has not been without its effect on industry generally.
- 2. This permanence is particularly striking in view of the readjustment period since the war. The present writer raised the question just prior to the depression as to whether the methods or even the principles of scientific management would not have to be very closely scrutinized and possibly materially modified during the coming years of a declining market. Rather extensive investigation, both personally and through correspondence, has revealed the gratifying fact that these principles have in no way been found wanting, and that in most cases not only the principles but the methods used have stood up together with altogether healthy refinements and modifications made to adapt them to changed business conditions.
- 3. Scientific management has affected industry generally by pointing out the only known method of attempting even a partially satisfactory solution of wage problems, that is, by making a sharp distinction between the amount of work and the amount of pay for that work. Only through a determination of a standard output may industry be assured against a disproportionate increase in the cost of living due to possible decreased production with increased wages.
- 4. Another significant influence has been the lesson pointed out so forcibly that it is the little things which produce profits. Seldom can dividends be paid out of revolutionary inventions—they must ordinarily come through constant attention to what someone has called the "tremendous trifles."
- 5. Possibly the greatest effect, although as yet not very widespread, is the emphasis which scientific management has placed on the responsibilities of the management as against those of the workman. It has been shown conclusively, I believe, that it is the management's duty to bring about thorough standardization

and accurate planning and control before asking the workman through an incentive method of payment to exert himself toward increased production.

- 6. Finally, the general acceptance on the part of the average manager of the desirability and place of the scientific method in the management of business has been particularly noticeable during the last few years. It is true that many managers still shy at the word "science," and it is true that we have as yet barely scratched the surface in the application of the scientific method to industry, particularly as regards departments other than the shop; but the entering wedge has been driven, and as Prof. Sederholm of Finland has said.<sup>1</sup>
- stage, but the time will soon come when people will regard shops without a planning department of sufficient size, shops where hundreds of laborers are managed by half a dozen of engineers and foremen, with the same wonder as is felt by us when we look at the skeleton of a *Diplodocus carnegii* with its gigantic body and almost microscopical brain.

#### II. NEGLECTED OPPORTUNITIES

It has previously been stated that it would be improper to claim for the scientific management movement any monopoly of effort and accomplishment along many of the various lines indicated previously, although this movement has always been at the front of new developments. In considering what seem to me to be some of our neglected opportunities, I wish also to state that scientific management as such must not be blamed because it has not completely solved partially unsolvable problems. It must be remembered that many of the unsatisfactory conditions under which we work today are heritages of an age long past. The problems and ills of the individual, due to the massing of workers, the economic dependence of the employee on the employer, the specialization of process and the minute subdivision of labor have not, as is sometimes intimated, been brought on by scientific management. They are inherited problems and abuses with which, in common with other agencies, scientific management must deal. The following queries are therefore raised, as to whether scientific management has made as aggressive an attack on these bigger problems as it might have. The attempt will be made to deal only with those features which

<sup>&</sup>lt;sup>1</sup> COPLEY, FRANK B., "Life of Frederick W. Taylor," vol. 2, p. 126.

we can remedy or at least strongly ameliorate, and which, therefore, will be of concern to any group interested in the future of the movement.

A. The Art as Distinct from the Science of Management.—Oliver Sheldon has forcibly brought out¹ the distinction between "operative sciences," which embody standards of procedure with respect to different kinds of processing, the "managerial sciences," or the sciences of putting these standards into operation, and the general administration of an enterprise. He further brings out very clearly the fact that, while there may be a considerable managerial science, there is without question much in management that must remain an art. There must still be required the skilful exercise of human faculty, since there can be no science, for instance, of cooperation—cooperation rests not on scientific but on ethical principles. I believe Sheldon has done a real service in putting this viewpoint before us and that, because we have not sufficiently recognized these distinctions in practice, we have fallen into a number of serious errors.

I wonder whether we have given sufficient weight to the question of personality in management; I wonder whether we have not tended a little too strongly to establish scientific methods, to tie these together into a logical "system" and to rely on this oftentimes beautifully designed machine to accomplish our objects, forgetting that such a system, just as is the case with any other system or mechanism, requires human direction and control?

I wonder if we have sufficiently realized that, in order to live up to Mr. Taylor's ideals, the need of real leadership is even more necessary than under the older types of management; I wonder whether, on the contrary, there has not been a tendency to employ too cheap clerks at certain strategic positions in the organization, trusting that the carefully outlined procedure would make up for their lack of leadership and personality?

I wonder whether, with our admirably proper insistence on considering each individual as an individual, we have not obscured the possibility of making that individual and his fellows more productive and more contented through recognizing the psychological benefits to be gained through group dealings?

I wonder whether we have considered the question of fatigue from a too coolly scientific viewpoint?

<sup>&</sup>lt;sup>1</sup> Bulletin of Taylor Society, Dec., 1923, p. 210.

B. Labor.—Many of us feel that it is unfortunate that Mr. Taylor expressed himself so frequently and so forcibly on the question of "soldiering," and that he emphasized the profit motive on the part of the workman almost to the exclusion of other instincts and motives in life in which at heart he knew every workman is interested. This attitude on the part of the leader I fear has been too largely inherited by his followers. I believe it is true that the average American workman is not inherently lazy, but on the contrary is delighted to put forth his best efforts in production and in cooperation where he can be even reasonably assured that the management is doing its own part and that it really has his best interests at heart. Have we had the dollar so firmly fixed before our own eyes that we have assumed that the workman is similarly constituted, overlooking the workman's pride in workmanship, his logical desire to retain what he considers to be his own tools of livelihood . . . his trade secrets . . . and his desire to be a regular fellow in his own group? I wonder if we have sufficiently remembered Mr. Taylor's admonition:

The principles of scientific management must rest upon justice to both sides, and it is not scientific management until both sides are satisfied and happy.

Now if the mechanism . . . of scientific management . . . is used by unscrupulous people, it is not then used under scientific management; it may do a durned lot of harm.<sup>1</sup>

# Can we honestly say with Mr. Taylor:

. . . if the results of my work were merely to increase the dividends of the manufacturing companies, I certainly should not devote my time to this object. Scientific management is for me, then, primarily a means of bettering the condition of the working people.<sup>2</sup>

I wonder whether we have sufficiently realized that, to get real cooperation on the part of all of our people, it is desirable to give them the psychological appeal of at least some stock ownership in the enterprise? Experience has proved that stock ownership by the employee has a tremendously beneficial effect upon the management. Incidentally, I wonder whether we have considered also our obligation to the public at large, whether

<sup>&</sup>lt;sup>1</sup> "Hearings," pp. 1459, 1462.

<sup>&</sup>lt;sup>2</sup> COPLEY, FRANK B., "Life of Frederick W. Taylor," vol. 2, p. 236.

Mr. Taylor's comment given below does not apply with considerable force even today:

Most of us see only two parties to the transaction, the workmen and their employers. We overlook the third great party, the whole people, the consumers, who buy the product of the first two and who ultimately pay both the wages of the workmen and the profits of the employers.<sup>1</sup>

The rights of the people are . . . greater than those of either employer or employee.2

C. Organized Labor.—Scientific management has neglected its opportunities and obligations to organized labor. There are many indications that organized labor's attitude and cooperation with managers in the application of the principles of scientific management have changed for the better. We should, however, show more readiness to meet organized labor halfway in a constructive program, and also aid by combating in a helpful non-antagonistic spirit the uneconomic practices on the part of some labor leaders. I believe there are great possibilities for cooperation, but they imply a prime obligation on our part of absolute straightforwardness and friendly instruction in the high principles for which we stand. It also places upon organized labor a prime obligation of recognizing that all men are not created mentally, mechanically or productively equal, and of allowing individual liberty to produce up to individual ability.

Mr. Taylor's attitude towards organized labor has been misunderstood by most people. For his views we can turn to his own writings:

- . . . in many establishments under the ordinary system, collective bargaining has become and is in my judgment an absolute necessity.<sup>3</sup>
- . . . there is no reason on earth why there should not be collective bargaining, under scientific management just as under the older type, if the men want it.<sup>3</sup>
- . . . I have not the slightest objection, and never have had, to collective bargaining, but I merely say that under the principles of scientific management that necessity has never come before me.<sup>4</sup>

<sup>&</sup>lt;sup>1</sup> In a letter written in 1911, COPLEY, FRANK B., "Life of Frederick W. Taylor," vol. 2, I, p. 13.

<sup>&</sup>lt;sup>2</sup> "Principles of Scientific Management," p. 136.

<sup>&</sup>lt;sup>3</sup> "Hearings," p. 1444.

<sup>4&</sup>quot;Hearings," p. 1458.

D. Lack of Adequate Analysis.—What I shall have to say under this topic will be largely destructive criticism. It is offered merely as having possible value for future analysis.

It seems rather an anomaly to charge against engineers and scientific managers above all things a lack of analysis, yet I feel that this is one of the most serious criticisms to be leveled against most of us who attempt to follow the technique of Mr. Taylor. I believe it is partially due to the fact that we are so intent upon following him that we do not always stop to realize that he himself would undoubtedly have disapproved, under present conditions, numerous things which we have done and have left undone in his name.

Our most serious failure is neglecting sufficiently to analyze the particular sales, production and financial problems of the particular business before attempting to apply methods for more effective management. The fact that practically all groups particularly interested in industrial management have done likewise does not by any means excuse us who have the reputation for possessing a scientific, analytical method of attack. I refer specifically to an analysis of a general type of industry (assembly or continuous); to the present size of the business; to the competitive state of the business; to the character of the personnel as regards the skill required on the part of the management and the workmen, and the general "intelligence level" of this personnel; to the traditions and type of management, i.e., whether autocratic or democratic, its policy as regards promotion from the ranks, and the mental and spiritual development and coordination of personnel; to the degree of quality required in the various operations and in the finished product; to the existing degree of departmentalization, and the possibility of modifying present arrangements in this respect.

All these factors and many more, I submit, must be carefully analyzed before even the general type, much less the details of production control most suitable to the particular circumstances, can be determined. I believe we should not have quite so much argument as to whether centralized or decentralized management is better if we confined our arguments to a particular plant of a particular size, because the question of the proper degree of centralized as against decentralized control is very considerably one of size and departmental arrangement. Similarly, the types of organization, the questions of degree of functionalization, are

scarcely things to be fought over in general but only as regards a particular situation. We have had too much of a tendency to impose our pet mechanisms promiscuously on plants of widely different character, just as it was so long ago the custom with certain persons to sell family medicines good for all diseases. As a result, individual businesses have had to cast off these unsuitable mechanisms (mechanisms perfectly good in themselves when used under the right conditions), with the result that in more than one case I have in mind not only the mechanisms but even the principles for which we stand have become discredited.

Is it not still true that, as Robert G. Valentine said in 1915:

A great deal of the scientific management in use at the present day, whether in sales, finance, production or personnel, is similar to the situation in which a great deal of money might be spent in curing of flat foot a person who had some disease of the bone which might lead to amputation. This lack of coordination is an excellent illustration of one of the basic inefficiencies which permeates the world today.

It becomes so easy to let good enough alone, to use outworn mechanisms and to hold to outgrown notions. As Alexander Meiklejohn says:<sup>2</sup>

. . . The bane of a democracy is the man of easy solutions . . . such a man is a pest when there is thinking to be done. He does not need to think; he knows. He does not need to experiment; he has already found out. His father has told him, or his party, or his common sense, or his church.

It is a pleasure to quote Carl G. Barth:<sup>3</sup>

. . . the fact so often laid stress upon by Mr. Taylor himself . . . . that, while the principles of his system of management were essential, yes even perhaps as immutable as the laws of nature, the detail mechanisms he had to date developed for the attainment of the results aimed at, were necessarily subject to continual, if not continuous, growth and change. He laid such stress on this as to express the opinion that not a single one of his details, either paper forms or mechanical contrivances, would be in use ten years after he handed them over to myself and my co-workers.

Because Mr. Taylor invariably insisted upon the use of such forms and contrivances as had been developed . . . up to a certain time,

<sup>&</sup>lt;sup>1</sup> Chap. XIV, p. 203.

<sup>&</sup>lt;sup>2</sup> "College and the Common Life," Harper's, Nov., 1923.

<sup>&</sup>lt;sup>3</sup> Bulletin of Taylor Society, Dec., 1921.

until the members of a new organization should have become thoroughly familiar with these, his "system" undeservedly got the reputation of being an uncompromising and rigid code . . .

. . . Whenever a workman had learned to obtain results known to be possible by an implicit following of . . . instructions, Mr. Taylor even insisted on a special reward being given him for any suggestion that would lead to improved instructions and better results.

Mr. Taylor's whole spirit was that of continued progress, but by evolution only and not by revolution . . .

It is in this spirit that progress must be made.

E. Our Failure to Get Our Message Accepted.—It is folly to delude ourselves into believing that the message which we have been preaching for thirty years has reached the average or even the high-grade manager. The apparent salability of various "efficiency systems" and incentive payment plans, dressed up in new and attractive clothes but as a matter of fact violating the very basic principles of sound management which we have been proclaiming, would seem to testify to our failure to impress the average manager of industry.

Believing as firmly as we do in the fundamentals of the industrial philosophy initiated by Mr. Taylor, why have our mechanisms and methods received so much attention at the expense of the basic principles? Why have we failed to make management and men realize the mutuality of interest existing between employer and employee; to bring the management to a realization of its own responsibility as against that of the workman; to make the manager know that before he is justified in an appeal to the workman through incentive payment or any other measures to give forth the best he has, he, the manager, must first do his full share in standardization, planning and the providing of proper working conditions? Is this condition due partly to

1 "Hearings," p. 1393: "By far the greater gain under scientific management comes from the new, the very great, and the extraordinary burdens and duties which are voluntarily assumed by those on the management's side."

<sup>2</sup> Taylor certainly emphasized as hard as he could the part that standardization must play in good management. For instance ("Shop Management," par. 284): "It would seem almost unnecessary to dwell upon the desirability of standardizing not only all of the tools, appliances and implements throughout the works and office, but also the methods to be used in the multitude of small operations which are repeated day after day . . . In the type of management advocated by the writer, this complete standardization of all details and methods is not only desirable but absolutely indispensable as a

complacency, or to a lack of aggressiveness or persuasive powers on our part?

To be sure, it is sometimes difficult to get some managements to assume their just share of the work and the responsibility, and Taylor himself had his share of this difficulty. That the development of his principles of management would necessarily be slow, was foreseen by Mr. Taylor as early as 1895, and he emphasized the very necessity of slow development. Yet I

preliminary to specifying the time in which each operation shall be done and then insisting that it shall be done within the time allowed."

Again (in par. 285) he says: "Neglecting to take the time and trouble to standardize thoroughly all such methods and details is one of the chief causes for setbacks and failure in introducing this system . . . It is uniformity that is required. Better have them uniformly second class than mainly first with some second and some third class thrown in at random . . . In fact, however, it is not a matter involving any great expense or time to select in each case standard implements which shall be nearly the best or the best of their kinds. The writer never has failed to make enormous gains in the economy of running by the adoption of standards."

Again ("Shop Management," par. 297-8) in listing steps in developing scientific management he puts at the very top of the list: (1) The introduction of standards throughout the works and office.

The necessity of standardization as a fundamental prerequisite was again emphasized in par. 269.

""Hearings," p. 1445: "... I wish to repeat and emphasize, that nine-tenths of the trouble comes from those on the management side in taking up and operating a new device, and only one-tenth on the workman's side. Any difficulties are almost entirely with the management." This is constantly emphasized (see pp. 1401, 1465).

An inkling of what some of these duties of the management are is given when he says (Hearings, p. 397): "... I can say, without the slightest hesitation, that the science of handling pig iron is so great that the man who is to handle pig iron as his daily work cannot possibly understand that science... the man who is fit to work at any particular trade is unable to understand the science of that trade without the kindly help and cooperation of men of a totally different type of education..."

<sup>2</sup> "Hearings," p. 1437: "... even in the most elementary work, to make this great change (to Scientific Management) is a question, not of a month, not of a year, but two or three years, and that in an intricate establishment it is a matter of not less than five years before a great increase in the output per man can be made."

"A Piece Rate System," par. 89: "From what the writer has said he is afraid that many readers may gain the impression that he regards elementary rate fixing and the differential rate as a sort of panacea for all human ills. This is, however, far from the case. While he regards the possibilities of these methods as great, he is of the opinion, on the contrary, that this system of management will be adopted by but few establishments, in the

find most managers are willing to do their share when it is made clear to them of what their share really consists. I wonder how much of our failure to impress the manager and to secure the progress we desire is because we have given more thought to training the workman than we have to training the management?

Much of the disregard of what I believe to be fundamentally sound principles of industrial relationship as laid down by Mr. Taylor has been due to a lingering prejudice against the name "Taylor" and to a reaction of scepticism connected in the linking of the terms "scientific" and "management."

Undoubtedly also, our message has not been more fully absorbed because, as Taylor himself has pointed out, the easy way is usually more attractive to the average manager. Short cuts are particularly tempting. It is due also to the fact that we have been talking calculus much of the time when the manager is still struggling with elementary algebra.

Primarily, however, I believe it is a case of psychology. Mr. Taylor himself was not noted for his tact and appreciation of the psychological elements in human affairs, and I am afraid that we

near future at least, since its really successful application not only involves thorough organization, but requires the machinery and tools through the place to be kept in such good repair that it will be possible for the workmen each day to produce their maximum output. But few manufacturers will care to go to this trouble until they are forced to."

"A Piece Rate System," par. 90: "It is his opinion that the most successful manufacturers, those who are always ready to adopt the best machinery and methods when they see them, will gradually avail themselves of the benefits of scientific rate fixing; and that competition will compel the others to follow slowly in the same direction."

¹ In this connection a word of emphasis is justified on the value of the task idea, particularly when preceded by rigid standardization and coupled with incentive payment as in Mr. Gantt's task and bonus method of payment. The task when thoroughly operative furnishes a tremendously democratic pressure from below in forcing the management to hold up its end of the bargain continuously. Taylor says ("Principles of Scientific Management," p. 39): "Perhaps the most prominent single element in modern Scientific Management is the task idea . . . The task is always so regulated that the man who is well suited to his job will thrive while working at this rate during a long term of years and grow happy and more prosperous, instead of being overworked."

Again, on p. 122: "The task and bonus are especially important from the fact that they are, as it were, a climax, demanding before they can be used, almost all of the other elements of the mechanism, such as a planning department, accurate time study, standardization of methods and implements, a routing system, the training of functional foremen or teachers . . ." etc.

have tended to forget certain principles of mass as well as of individual psychology. I am afraid that we have too often given the impression to the manager that nothing which he has or does is worth much, that we have asked him as well as his workmen to "lose face" by expecting that he "back up" on matters, which he cannot do without losing status, as well as by failing to give credit for good work and good suggestions where credit is due.

We must admit that some who are least sound in their principles and least scientific in their work have been better missionaries than we have. Impossible programs are proposed in the name of scientific management, and when these superficial substitutes are sold it adds to the doubt and distrust of intelligent management as regards the whole movement.

On the whole, however, as has been intimated before, I have found recently a very deep interest in really scientific methods of management and a much more open-minded and receptive attitude generally in any effort really to take advantage of what Mr. Taylor has given the world. For this we very largely have to thank the splendid constructive work of the Taylor Society under exceptionally able leadership. I am not preaching pessimism and discouragement, therefore, but exactly the reverse, for I believe we are on the threshold of a development along lines which we believe will far surpass anything in the past. But the extent to which we can take pride in this growth and its permanency, and the extent to which we will be relieved of the present necessity of denying responsibility for attempted short cuts, which have no part in our philosophy, but which nevertheless reflect back upon us, will depend upon the extent to which we first formulate and then secure the acceptance of the fundamental and underlying principles of this whole movement—the mutuality of interest of all parties, standardization as a basis of good management, the primary duty of the management to assume its full share of the work and responsibility; realizing that unless we ourselves emphasize these fundamentals we must not be surprised if others mistake the mechanisms for the essence. very directly the custodians of an industrial philosophy which is distinctly a "quality product;" upon us devolves the obligation of keeping faith with and proclaiming the ideals of its founder. Is it not possible for us to get our message across so that administration can distinguish the sound from the superficial?

#### III. OBLIGATIONS AND FUTURE PROBLEMS

Some of the outstanding problems which must occupy our attention in the future will be outlined very briefly.

A. Production.—One of the biggest problems ahead, I believe, is that of securing suitable foremen. Under the rapidly increasing complexity of modern business, in spite of the unquestioned advantages in attempting to meet problems of organization through instructional foremanship, there is going to be increasing difficulty in securing and training the right type of foreman. Not only the mechanical and managerial duties of securing maximum production at minimum cost, but also the increasing realization of the importance of the foreman from the industrial relations standpoint, is constantly emphasizing the necessity of training high-grade men for these key positions.

I believe that with restriction of immigration the question of the better utilization of such unskilled labor as we can secure, and particularly the devising of labor-saving equipment and methods to make up for an inadequate supply of common labor, deserve intensive study.

I feel that the question of fatigue must be given additional attention for the proper determination of rest and delay allowances. There is needed here the combined efforts of the production man, the industrial physician and the practical psychologist.

As regards mechanisms, the period of competition which we are entering will force the development of effective and more expeditious means of control, and new mechanisms of real value will undoubtedly continue to be devised. Simply to mention one such apparatus, we find need today of more adequate methods of determining the order of work, and thereby securing a better machine and departmental balance, in plants doing a miscellaneous jobbing or made-to-order business. Closely related to this is the need of further intensive study of lot sizes.

**B.** Distribution.—The importance of cutting down as far as possible the extremely high expenses of selling must not fail to receive more intensive study than is generally given it today. There are, to be sure, a few pioneer firms which are making real headway, but any one firm or group of firms can have but limited effect except by way of example on this truly national problem.

In a report of the Joint Committee on the Agricultural Industry, it is shown that of each \$1 spent for many articles in the

<sup>&</sup>lt;sup>1</sup> Reviewed in Scientific American, Dec., 1923.

United States in 1921, less than 50 cents in many cases represents the cost of the finished product ready to sell. The conclusion of the Commission is that we have outgrown our whole distribution system. The insistence of immediate service in every case where it is at all practicable has made manufacturing to order practically a thing of the past. We are confronted by the problem as to the means by which the increasing cost of production and warehousing pending the customer's demand is to be met, and to what extent field assembly plants can relieve the situation.

C. Finance and General Administration.—A further standardization and simplification of materials, and of varieties and finish of product, needs the detailed attention of factory executives.

Questions of seasonal industry, continuity of employment, unemployment insurance, service bonus and pension systems and the general corralling of the business cycle must continue to be studied in a scientific manner.

Industrial relations problems must continue to be investigated in a sympathetic manner. Since these problems probably cannot be permanently solved, it is therefore incumbent upon us to devise more adequate means for adjusting differences currently as they occur.

Our relations with organized labor, which has shown a very much more open-minded attitude toward the scientific management movement during the last few years, must be fostered. I believe one of our great duties is to minimize those seemingly irreconcilable points of differences which may remain, and to cooperate in the solution of common problems. We have an excellent opportunity to help in persuading organized labor that it is its duty to allow and persuade the individual to produce up to his individual ability. In order to secure that, organized labor must have confidence in our motives as respects both the group and the individual.

The following striking excerpts from the Resolutions of the American Federation of Labor have the ring of sincerity:

Industry must organize to govern itself . . . It must bring order to itself constructively or it will have an order thrust upon it . . .

It is not the mission of industrial groups to clash and struggle against each other.

Facts must take the place of opinion and selfish interest.

Labor stands ready for participation in this tremendous development.

Are we willing to help them?

<sup>&</sup>lt;sup>1</sup> American Federationist, Nov., 1923.

We have not, I feel, utilized as we might the many educational institutions which are giving courses on management. I believe that in a few years the profession of management will be generally recognized, and that our future managers will be expected to have had training in this, as in other professions. It is our obligation to see that the part which the schools of business play in this training is based on thorough understanding of what really constitutes sound management.

A prime educational duty before us is to foster the increasing readiness on the part of the banker to look beyond the balance sheet. It is only through a wider dissemination of truly scientific and broad-minded methods of industrial management that we may hope to secure united action in bringing about more enlightened administration of national and international affairs.

Related to this subject is that of the measurement of management. We have yet barely scratched the surface in this respect and, although the measurement of the *art* part of the management can never be exact, yet that part which is scientific has not yet had applied to it satisfactory yardsticks. In this connection the general question of executive reports needs further study.

One of the really big questions we must face in the future is that of getting back more nearly not to the one-man organization itself but to the essence of it so far as coordination, control and personal touch go. The manager in one-man organizations has many advantages in these respects over the manager of large plants. As soon as a manager is forced to subdivide his duties and departmentalize his plant, he loses much in control which he formerly held. Recognizing that this specialization is necessary in large establishments, it then becomes a matter of prime importance to set up some means by which this unified control and personal touch may be restored.

Finally, as regards our responsibilities as managers, I wish to quote the manager of one large establishment—an establishment to which we commonly refer as being one of the very finest examples of the application of Taylor principles and methods of management. In reply to my question as to the probable future trend of developments in his plant, he writes:

The most important development in our management methods in the near future will probably be improvement in management itself. We have an idea that, in general, the efficiency of the management is less at the present time than the efficiency of labor.







## PART II

# SCIENTIFIC MANAGEMENT IN GENERAL MANAGEMENT

#### INTRODUCTORY

The examination of scientific management in relation to general management in Part II shows the normal expansion of the Taylor system from the factory to the business as a whole.

Henry P. Kendall's chapter on "The Problem of the Chief Executive" is written from the point of view of the head of a medium-sized enterprise. It covers an examination of the problem of executive control of sales, of production and of finance and accounts.

"A Technique for the Chief Executive," by John H. Williams, consulting engineer in management, explains a proved method of executive control. Mr. Williams bases his discussion on the fact that "the job of the chief executive is just as concrete as the job of the production manager, the sales manager and a number of other executives whose functions are hardly less complex, though on a different scale." He believes that the chief executive of the past has been the victim of his organization, because its ramifications have been so many and so varied as to make it impossible for him to unify them. He presents a scientific method for the chief executive, covering the elements of cost, unification of records with reference to responsibility, the setting of management standards, a formula for expressing unit costs in terms of percentage of sales, the use of standards in judging managerial effectiveness and financial forecasts.

Dr. H. S. Person's chapter on "Shaping Your Management to Meet Developing Industrial Conditions" is a compact statement of the necessity of knowing the tendencies in the industrial environment; the change from a seller's to a buyer's market, and the reflection of that change in sound policy making. Market research, merchandise research, sales engineering, on the basis of which master plans, budgets and schedules of operation can be

built, and, finally, development of genuine cooperation and the type of executive who thinks and plans rather than retaining the traditional "go-getter" of the immediate past, will be necessary for success in the future.

E. E. Brooks, of the Dennison Manufacturing Company of Framingham, Massachusetts, examines the experience of his company with "Master Budgets of Sales and Production." The company manufactures 10,000 items, but the business is so planned that facilities are employed to capacity at practically all times.

The company plans for a definite percentage of expansion of its business each year. To bolster sales in times of depression, it launches new merchandise. When sales are easy, it withholds new ideas, to save them for times when it is difficult to make sales. The company tries to anticipate dull times by developing new merchandise for such times and also by developing salesmen.

Howard Coonley, President of the Walworth Manufacturing Company of Boston, Massachusetts, and Kewanee, Illinois, describes the relation of Walworth business to the business cycle, together with a description of budgetary control of sales, purchases, receipts and expenditures, in the chapter entitled "The Control of an Industry in the Business Cycle."

## CHAPTER V

## THE PROBLEM OF THE CHIEF EXECUTIVE!

BY HENRY P. KENDALL

The Point of View of the Medium-sized Enterprise.—My background is that of the small or medium-sized enterprise. read a great deal about and hear a great deal about large organizations—the United States Steel Corporation, the International Mercantile Marine and other big enterprises. The many schools of business administration which are doing such admirable work in business organization and finance focus their attention chiefly on the large institutions. I propose, however, to speak from the point of view of the small enterprise—one which is small enough to demand from its chief executive an intimate knowledge of the business, yet large enough to have the organization departmentalized and the chief executive free, as he should be, from routine executive work; an enterprise in which (to use a figure of speech suggested by the squally times through which we have been passing) the chief executive, as sailing master in fair weather, can leave detail management to his mates, but in which also in squally weather he can step to the wheel, keep his eve on the sky and wind and sails and compass, and show himself master in the handling of his craft. The master of such a craft must be, on the one hand, big enough to know the seas and shores, the rocks and rips, the skies and winds, and he must, on the other hand, be familiar with the detail handling of a ship.

In a business of this type the chief executive must be responsible not only for long-run and short-run policies and plans, but also for the organization of the enterprise and the coordination of departments—for keeping the heads of the various departments working together as a team.

Major Departments.—Some years ago, I expressed the opinion that an organization is logically divided into four departments—sales, production, finance and accounts, and personnel—and that they should be coordinate departments. I think I shall

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have to modify that now, and say that the departments which seem to be always major are three—sales, production, and finance and accounts, while other departments may be either major or secondary, or at one time major and another time secondary. according to the nature of the business or to particular circumstances. Purchasing, for instance, in some industries or at certain times may be routine in nature and subsidiary to production; in other industries or at particular times it may be relatively so important as to be a major department. One of the businesses in which I am interested is typical of many others; the purchase of one of the materials—cotton and cotton cloth—is so closely related to merchandising and to selling that, during these times of uncertain markets, we have taken such purchasing out of general mill-supply purchasing, which reports to the production manager, and made it, if not a major department, one which is nearly so in that it reports to the chief executive. In many manufacturing businesses the purchasing is more important than other phases of the business. In cotton manufacturing the value of the cotton is on the average two times the value of the wages and salaries and at the same time it is closely related to the merchandising of the product.

Then there is engineering. In many plants engineering means simply maintenance of plant, power transmission and mechanical equipment. In others, as in General Electric, Westinghouse or public utilities, engineering is almost the most important function of the management and is coordinate with other major departments.

Advertising is properly regarded as a tool of selling. I imagine that the definition of a mine can be applied to advertising—a hole in the ground into which money is poured—but in some businesses, such as are represented by one of the great clothing manufacturers of Chicago, advertising may dominate what is ordinarily called merchandising and become a major department and the advertising manager essentially the merchandising manager; quite properly, in the particular instance, a reversal of the usual procedure.

With respect to finance and accounts; if there is a comptroller, the treasurer may in many instances be but a glorified eashier or trustee of funds; but if there is intricate financing to do, there is logically coordinate responsibility of both treasurer and comptroller.

In many enterprises the function of industrial relations may be of such importance as to be classified as a major department, the head of which reports directly to the chief executive; in others it may properly be subsidiary to some other major department.

Research may be a major or a secondary function in an enterprise. There may be sales research headed up under the sales department, or research in industrial processes headed up under the production department, but in some enterprises—as in the electrical industries—research may be relatively so important as to be properly a major department.

Likewise with respect to legal and other staff functions; usually minor in importance, in some industries one of these may loom up as of major importance.

I have named some eight divisions of a moderate-sized enterprise which may be major departments, too many to be reporting to one chief executive. The president of the Western Electric Company was asked how many people should report directly to the president of a large industrial company. He said eight or nine were reporting to him at the present time, but that it was too many and he was reorganizing his executive function so that only four or five would report directly to himself; and I imagine that four or five is enough. Not that a chief executive should not have contact with others, but that is about as many general functions as should directly and regularly head up to him.

Organizing the Enterprise.—The first big responsibility of the chief executive is the organization of the enterprise. I used to think that organizing ability and executive ability were practically synonymous terms. I have changed my opinion on that; and one of the most convincing experiences which would have caused me to change my opinion, had I not done so earlier, occurred in Washington during the war. Many a big man, with the reputation of being in his business a superman, came to Washington and failed signally as an organizer! In his own business he had been all his reputation claimed as an executive working out policies and making routine decisions day after day; and it was concluded, therefore, that he would be a great organizer; but when it came to creating new organizations in Washington—that was quite another matter! Why? Because the difference between organizing or creative capacity and executive ability was usually not recognized when men were called to service in Washington.

Walter Dill Scott gave some testimony to the point. He was the man who created an organization in the War Department to classify and rate the draft army. A part of his organization was in Washington and the larger part at the cantonments supervising work. He said that, curiously, no constructive ideas came from the men at the cantonments; creative ideas came from the men in Washington. He concluded that the men at the cantonments were so busy at the executive function—keeping the work in hand going smoothly—that their minds did not have time to function on the creative side. So he tried the plan of alternating men between the cantonments and Washington, and he found that men who had not given birth to a constructive idea while at the cantonments became creative at Washington, where their jobs were to think and they could see things in perspective.

This function of organization, of selecting and developing a staff, is one of the most important for which the chief executive is responsible, and presents many interesting aspects. I shall consider only two or three of these.

It takes time to develop an organization. Nothing illustrates better the idea that the boy is father to the man. The good organization of today was not built today or yesterday or last year; it is the outcome of policies and plans established a good many years ago. You cannot develop an organization inside of five years—probably not inside of ten. The only exceptions I have seen were two or three instances in Washington during the war, when under the particular conditions the few organizers who knew what they wanted could reach out over the country and pluck any man of tested and known capacity. But in the course of developing organizations in industry it cannot be done in that way.

Another phase of the organization problem is this: As a business grows, the kinds of responsibilities required by the different departments change, but not all men have the capacity to develop to meet the demands of these changes. When an organization is small, an executive may be found who is splendid as a department head, but as the responsibilities of the department increase in range and intensity he does not develop a corresponding capacity. It has been said that all men are born free and equal, but that seems not to be so. You can find differences as great as 400 per cent in the capacities of workmen at machines or benches, but can find greater differences than that in the capaci-

ties up the line of executives. If the business is growing and the responsibilities of the various members of the organization are increasing, the chief executive will soon find himself confronted by personal problems; he is faced by the problem of relieving men of responsibilities which have increased more rapidly than have their capacities, or of permitting the supervision of a function to become unbalanced in its relation to the supervision of other functions—a deterioration of coordination. It is a delicate and difficult task, this shifting men around or possibly pensioning them off and at the same time retaining cooperation and good will. It is a problem the chief executive must face alone.

Now, just because this problem of organization illustrates the idea that the boy is father to the man, it is essential for the chief executive to keep his eye on the junior executives. I have made it a principle—not without exceptions—not to permit an executive to select his assistants. That is against the theory and practice of a great many chief executives. I hold to my particular point of view not because executives are not reasonably successful in selecting assistants but because an executive is not likely to select an assistant who is complementary to and rounds out his own personality and capacity. Few men have all-round capacity; there is some part of every executive not so well developed as some other part. If he alone selects his own assistants, he is likely to select a man who is cast in the same mold as himself, who is not likely to round out the capacity of his chief, who is not likely to stimulate him. On the other hand, there must not be too great a difference in characteristics. If the chief executive and his assistants are wise in the selection of junior executives, they will supplement a major executive with an assistant of a complementary type—enough different to stimulate him, but not so different as to impair esprit de corps. William James in an address on the value of a college education made the statement that its value sums up in the ability to know a good man when one sees one. The selection of major and junior executives is one of the great responsibilities of the chief executive.

Handling the Organization.—A good many years ago I read in some magazine an article entitled "Hands." Among other things it described the hands of the skilful driver of horses, calling attention to the fact that some men have a delicacy of touch which is marvelous, enabling them to anticipate what a horse is

going to do and to convey information to the horse; an uncanny skill in controlling and guiding the nervous, restless and excitable horse. It is not muscular strength, but a delicacy of touch, an intangible something. Now, I believe there is a similar finesse in handling an organization, not by giving orders and commands—I think that is seldom necessary—but by delicacy of touch on the reins—suggestion and inspiration. You can find plenty of instances in which the chief executive has delicacy of touch or not.

The Value of Perspective.—There are many things which enter into the capacity of a chief executive to direct an enterprise and guide the associated executives. Not the least of these is the ability to take a detached point of view. The chief executive must not make the mistake of always standing at the wheel. In the medium-sized plant which we have in mind he should be able to do that in time of emergency, but at other times he should be free from details. He should be able to study his business from the mountain peak, in perspective; he should be a student, not merely of his own business, his own product or his own market, but also of the industry to which his business belongs, general market conditions, general financial conditions, the economic conditions of the country, the conditions and tendencies of business the world over. Of course, it is necessary to meet the payrolls today and tomorrow, but the chief executive who is thinking in terms of years ahead is he who can make the quick and sound decisions today. The chief executive should have imagination and build a picture of the future—the development of his business, the plant, the organization, its personnel. He should construct a drama of the future in his mind, peopling it with personalities and achievements, a drama always changing in the light of new information and new ideals. Although the drama may be a changing one, at any moment it stands as a definite plan in accordance with which the decisions of the moment may be made, and the more wisely because there is such a plan in the background of the chief executive's mind. It is sometimes surprising to a staff to see how a chief executive can give a quick and accurate decision, even before a proposition is completely stated; but it is because he has dreamed his dream. has his plan for the future and can instantly relate the particular problem to it.

But the chief executive cannot do that if he is overwhelmed with correspondence and other routine work. It is essential that he shall have opportunity for detachment, shall keep a generous margin of safety for studying his business in perspective, for long-run policies and plans, a generous margin of safety against fatigue and exhaustion of energy—the fatigued mind is the timid mind. There are times when the executives must be called together to consider problems which seem almost insurmountable. If the chief executive cannot carry into such a conference vision and a vast range of information obtained from outside contacts, reading, thinking and observation, a fresh and agile mind, an optimism, enthusiasm and inspiration which he can pass along to others and inspire them to pass along throughout their departments, then he is not meeting his responsibility. I hold to the theory that executive capacity is something more than an intellectual quality. I believe that the years in which I have done my least effective work are the years in which I have permitted myself to become too much occupied with routine, and the years which have counted most have been the years when I have spent part of my time upon the mountain height, studying my business and business in general in perspective. And it is a duty of the chief executive to inspire each of his associates to maintain the same margin for study of his responsibility in the large, and the same margin for health and a clear mind.

Imagine the responsibility of the sales executive in these times. When the men come in from the field, discouraged, dejected, having lost confidence in their house, their product, and believing that competitors are having everything their own way, then it is the responsibility of the sales management to bring to the problem that optimism, that buoyancy, that bright eye and pleasant smile and those keen and encouraging words which will bring to his men an inspiration which will send them back into the field with enthusiasm and with the certainty that they are riding on the top of the world.

That is possible only if the chief executive and all executives—major and junior—preserve a generous margin for the healthy mind in a healthy body.

Coordination of Functions.—We are considering the responsibilities of the chief executive from the point of view of the moderate-sized manufacturing enterprise, and in such an enterprise he himself must be responsible for the coordination of functions. Therefore, he must know the departments and how they operate; he must know their problems and methods, and

guide them in working together precisely and without friction to the accomplishment of a common purpose. In time of storm he must be prepared to take the wheel. And he must know what he is doing when he takes the wheel.

Production.—We have had a production problem, all of us. During the past decade, and particularly during the war, stress was laid on the production problem—the increase of output per unit of floor space, per machine, per capita. Tremendous work has been done in increasing output and in lowering costs. I have heard many men, some of whom are pretty close students of scientific management, say during the long period of rising prices and active business: "Yes, scientific management is fine on production; you build up a big planning and supervising organization and get results; but wait until the time of falling prices and decreased demand!" And I confess that during the small dips which appeared during the period of general rising prices, I was a bit uncertain, and my confidence in scientific management was not unshaken. But I can bear witness, from actual experience, that without scientific management we would not have been able so securely to meet the decline in prices and in business which we have had to meet in our own business; that, without the greater knowledge and greater control which scientific management has given, we would not have been able, in the concerns in which I am interested, to get production down to match demand, to reduce business to 55 and 65 per cent of normal, and still make both ends meet. It has interested me to observe the greater precision with which scientific management has enabled us to meet the situation; for instance, to see the ratio of sales to inventory change from 2 to 1 a few years ago to 4.5 to 1 after the Armistice, and then, when greater pressure came on, to 7.5 to 1, a thing which we would have thought impossible a few years ago. I am glad to have been able, on purely selfish grounds, to demonstrate what scientific management can do with falling prices, a falling market and a falling production.

Sales.—There are a few real merchants in industry today. Practically every enterprise has its sales manager, but, so far as I can see, skill in merchandising, a science of merchandising, is very little known in industry. There has been a lot of literature on selling, but we still have much to learn. There are industries which have not learned merchandising at all. I heard one of the closest students of marketing say, a short time ago, that two

industries had never learned how to merchandise their products—the textile and the paper industries. I happen to be interested in both, and I think he is right. So far as it has been my fortune to observe, the textile industry in this country does not know how to merchandise. In that industry success or failure today may rest upon the ability to merchandise.

The emphasis is now upon selling. How can we build up business? There are three essentials to selling: knowing your product, knowing the market and knowing the trade channels. The problem of the sales executive backed by the chief executive today is, on the basis of these three essentials, to create new markets. To guide and sustain the sales executive, the chief executive should know as much about merchandising as the latter, and should now focus his attention upon the latter's problem. He has got to help the sales executive master the situation in one of three ways: find a new market for the product, modify the product to meet the requirements of an existing market or develop a new product to meet the requirements of an existing market.

Never have the sales manager and the chief executive been faced with the problem of selling their products as they are today. It has become a problem of real merchandising—knowing your products and your competitor's products, knowing the market and the trade channels. The salesmen of one of the concerns in which I am interested have been reporting for 15 years that in one item we were doing 65 to 75 per cent of the business of the country. And we all believed it! But as a result of some recent critical sales research we have discovered that for the year 1921, when we had the largest output in our history, we were doing only 38 per cent of the business of the country. While that was disappointing to some of the organization, it was particularly heartening to me; I saw a 62 per cent mark to shoot at instead of a 35 per cent mark.

You cannot secure a control of sales until you have real merchandising; until you know what each department can do and at what cost, and what each market and each section of a market can take, all with respect to each product. Then you can develop quotas; then you can make budgets of sales and production; then you can develop budgetary and financial control.

Finance and Accounts.—The chief executive must be free from detail, but he must know constantly the details of progress and

accomplishment. Information must come to him, so organized, predigested and interpreted as to give him a picture of conditions. That makes finance and accounts one of the most important functions of an enterprise.

Charles G. DuBois, president of the Western Electric Company, who came to his position through the accounting-comptroller line and who practically established in American industry the importance and technique of that function, was once asked why, with so many interesting functions and opportunities in Western Electric, he chose accounting. He replied, "Because there was no competition in that line." Finance and accounting, and the work of the comptroller, represent a side of management which in the past has received too little consideration and has been valued at too low a figure.

What is needed for the shaping of policies and an intelligent control in an enterprise? First, a balance sheet and incomeexpense report. Some executives are satisfied with such a report once a year; some require it every half year or every quarter. I do not feel comfortable if I do not have one every four weeks, and the accountant has to get his statement in promptly at the close of each four-week period. This gives a cross-section of the business 13 times a year; but that is not enough! Some executives seem to think that a balance sheet and income-expense statement is sufficient. But there are other not less important statements which should come regularly to the chief executive. He should have regularly a balance sheet and profit and loss statement (so to speak) on every product and every market such as unit costs and sales for each product and sales by territories and products. He should have weekly a summary of cash tendencies. The sales manager, the production manager, each executive should have similar reports covering his respective interests. There can be no strategy of merchandising and production for the chief executive, and no tactics for the departmental executives, without the information and control yielded by such reports.

The banks have always centered their attention on the conventional balance sheet and income-expense account, and some of them are coming to give more attention to other information—ratios of balance sheet items and other data indicating tendencies for various industries. It has interested me to note that the credit vice-presidents of some of the big banks have

begun to realize that they have been giving and refusing credit without adequate information, without knowledge of what they were really doing; sometimes withholding credit and causing bankruptcies at a time when they should have had the confidence and courage to see the concerns through their difficulties. Every business, including the small business, should have the comptroller function developed, even if there is no executive with the title of comptroller.

It has been said that the sales manager should be an optimist. Possibly the comptroller would be classified as a pessimist. any rate, the other executives are inclined to consider a good comptroller a kill-joy, the gloom-artist of executive committee meetings. The others may point to a big volume of sales, to low production costs, and begin to talk of new plants and equipment and other enormous expenditures, as during 1920; and then the comptroller speaks up: "No, gentlemen; here's your tendency and here's where you're going to arrive next year; instead of expansion its going to be retrenchment;" and he proceeds to kill that vote for a new plant or the investment in a new sales territory. It is a great comfort to a chief executive to know that there is a man on the comptroller's job, surrounded by figures which pour in on him from all sides, digesting and interpreting them, ascertaining tendencies and finding the substantial facts which give each major executive control in his department and the chief executive control with respect to general policies and plans. I have recommended strongly to the college of which I am a graduate, a college conspicuously launched on the course of cultural education, that they establish two new courses as cultural courses accounting and statistics; these are the language of the social sciences, of economics, of business.

The Personnel Department.—One of the best investments any business can make is a competent personnel director or supervisor, in a position of major responsibility, who represents the management to the employees and the employees to the management. He should report directly to the chief executive. The responsibility for the kind of plant you have, the kind of spirit, the output and the efficiency, in a moderate-sized business at any rate, comes right back to the chief executive. The personnel department is the department through which he expresses himself with respect to that phase of his responsibility.

The Future. . . . I believe industry passes through cycles of change. We have had the cycle of the development of labor-saving machinery; the cycle of the growth of the corporate form of industry and of big combinations; the cycle of the distribution of securities and of the borrowing of capital from wealthy countries of the world; we have seen centralized and cooperative selling and purchasing. What next? From my observation I will hazard the guess that we are about to see a cycle of refinements in management. The profits are going to come from the little savings of standardization, of better planned and better controlled operations, with perhaps another wave of centralization. The tendency will be accelerated by the many failures and losses of working capital due to the war and its aftermath: by the fact that production is somewhere between 50 and 75 per cent of normal; that labor costs are 65 per cent above pre-war normal; that costs are 50 to 75 per cent above normal, with lower relative costs in Europe; that the world's financial systems are out of equilibrium. How is industry in the United States going to adjust itself to new conditions; to meet the new competition? Certainly not by an increase of plants—at least in the immediate future. Speaking by and large of industry in general, I think I see a rather drastic reduction in the number of plants—the sort of thing facing the automobile industry, the rubber industry, the metal-working industry, possibly the textile industry.

Vision and Leadership.—Outside of the immediate strategy of the conduct of his business, what responsibility has the chief executive? It is that of vision of the future and leadership to new relations and conditions. For instance, we have heard, during and since the war, that labor unions are coming to dominate and gain control of industry, that a man can no longer run his own business. There has never been a time when the balance of power has not been with industrial management and, if that situation is upset, it will be the manager's own fault. But management must have vision and show leadership. Unfortunately, neither our form of government nor our form of industry seems to have been able to develop great leaders. That responsibility is distinctly up to industry; it has a responsibility for the kind of citizenship we are building. There are industrial communities in my part of the country which one dislikes to go into:

they are sorry, sad, sickening places; and they have been made so by the probably involuntary and unconscious attitude of a relatively small group of leaders in industry. I believe these communities could develop a happy and prosperous citizenship—and future leadership in industry—were there vision in present leadership. Industrial management must realize its responsibility for these things as well as for excellence in technical management.

### CHAPTER VI

# A TECHNIQUE FOR THE CHIEF EXECUTIVE

BY JOHN H. WILLIAMS

#### I. INTRODUCTION

The position of the chief executive is the most important and at the same time the least understood in industry.

To the employe it means the divine right of kings—power and the right of decision.

To the chief executive it too often means that he is the hardest worked man in the world, and that, unless he is everlastingly on the job looking after and watching everything, the business will go to pieces.

It really means those things which, through circumstances and environment, the person in question happens to identify with the position of chief executive.

Even the man best suited both in temperament and ability for the position of chief executive is largely dependent upon the circumstance of his environment for what he will do with his ability. This must continue until the position is subjected to the same analysis and specifications as other positions. When a standard has been established, something to live up to, chief executives will be as good as their ability.

#### II. THE FUNCTIONS OF THE CHIEF EXECUTIVE

The function of the stockholders and the directors is legislative; that of the chief executive is executive. A stockholder or a director who in that capacity executes, or a chief executive who in that capacity legislates, is a failure.

The chief executive, as I see him, is the neck of the bottle through which passes the authority and responsibility established

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The author calls attention to the fact that this chapter is not a complete reprint of the original article which appeared in the *Bulletin of the Taylor Society*, and that while his mind has not changed with reference to essentials, his emphasis would be different if he were to rewrite the chapter.

by his directors, and accordingly his functions may be briefly summarized as follows:

- 1. To interpret the policies of the stockholders and directors in terms of the concrete problems of the enterprise and to represent them.
- 2. To work out with the directors the objective of the enterprise and the scope and limitations of its activities.
- 3. To select, appoint and maintain the major executives necessary for the conduct of its affairs.
- 4. To present the objectives determined upon to the major executives, and to work out with them a plan for their accomplishment evidenced by a budget expressed in the terms of men, money and things, and subdivided according to the responsibilities for its execution.
- 5. To follow up the activities of the enterprise and keep the directors informed as to results and their significance.
- 6. To constitute an available, sympathetic and informed counselor to the major executives and to help them to adjust such differences as may arise between them.
- 7. To keep the major executives informed of each other's accomplishments and help them to see themselves and their functions as part of a whole which is greater than any one of them.
- 8. To follow up and appraise the work of major executives in terms of their assigned responsibilites and budgets, and to help them to see themselves and their work as their associates see them.

I have said nothing with reference to the issuing of orders or settling of disputes, or in fact the dealing with detailed things at all, as part of the function of the chief executive. These have no place in his duties as chief executive. If a business is small, and he happens to assume detail duties, such service should never be permitted to be confused with his service as chief executive.

No Man Effectively Responsible for What Is Beyond His Control.—Ability to judge and select men is frequently considered the greatest attribute of a chief executive. In the sense of the word "chief," and omitting the word "executive," this is true; but such a man depends largely upon the executive ability of those whom he selects rather than upon himself for the direction of his affairs.

This by no means implies any belittling of the man who has the ability to select others to do his work for him. Beyond all

question, provided the organization which he serves is big enough and those he selects are made conscious of their responsibility, he is the most valuable man an organization can have; but I think it is a mistake to call him chief executive.

The title "chief executive" conveys responsibility as well as authority, and no man can be effectively responsible for that which is beyond his individual control. The right to hire and fire does not carry with it the *guidance* implied in effective control, which should be the basis of all direct responsibility and the essence of the function of the executive.

The position of the chief executive has two distinct phases:

A. Functions.

B. Methods.

The latter phase is the one under special consideration. I have referred to the former only because, without a brief statement of the "functions," one cannot judge the effectiveness of the "methods" to be described. Methods are the least understood, and without them there can be little hope of realizing one's objectives, regardless of the wisdom of a plan or the spirit of its execution.

#### III. METHODS FOR THE CHIEF EXECUTIVE

Methods may be defined as a means whereby:

All the facts are made available.

Policies and plans are coordinated and expressed.

Results are fairly appraised.

Causes and responsibilities are traced.

I am not interested in these separate phases, or alternatives for them, but in their coordinated relation as a whole.

Most of the methods in common use have come from the bottom up, and consequently are limited to the scope and objectives of the departments for which they were designed. They are like the different monetary systems of the world.

It is generally recognized that it would be a great advantage were all the enterprises within an industry to keep their books alike. An effort in this direction has been made by the Interstate Commerce Commission with reference to the railroads. It is this sort of thing carried, however, beyond conventional accounting to duties and responsibilities and the coordinating of functions that I have in mind. My object is to present the outstanding features of the evolution of big business in this direction, and to

present them in their coordinated relation so that one may see them as a whole.

Accounting as a clearly defined technique is much older than management and developed an integrity of its own long before management can be said to have existed as anything more than an undifferentiated faculty. This accounts for a certain domination which accountants have exercised over owners, if not over managers. However, one may see the clear domination of management, without the sacrifice of any fundamentals of good accounting.

The chief executive of the past has been a victim of his organization. Its ramifications have been so many and so varied as to make it impossible to unify them. He has, of necessity, spent much of his time in "figuring exchange," as it were.

This was necessarily the case until each unit could become sufficiently developed to demonstrate its needs. These needs are now well known, and the time has come when we must reduce them to the smallest number of common functions and denominations, that the chief executive may more easily coordinate them and have time for those broader features of his position which are coming into strong relief as the confusion of pioneer work clears away.

As a first step, responsibilities and duties must be more clearly defined and all results expressed in common terms. For instance, the statement for the chief executive can and must be literally a copy of the summating lines of the statements of those executives to whom he has delegated duties and responsibilities, added together, if he is to be effective as chief executive.

To accomplish this, one must first find some form of expression of results suitable alike to all subdivisions of an enterprise, and at the same time such as to enable the setting of standards, readily adjusted to the changing conditions of industry, by means of which these results may be judged.

Profits and losses will not do. They are affected by too many things. They are in their nature a final result; by the time we get them it is too late. What we want is information with reference to the things antecedent to profits and losses—from which profits and losses result—while there is yet time to affect them.

If you had to motor to Tarrytown, a distance of some 30 miles, in an hour, while your watch would tell whether you got there in the hour, it would be of no help in determining your progress,

while there was still time to affect it. If, when the hour was up, you had not reached Tarrytown, you would be in the same position as the executive who must wait until a loss is irretrievably made before he discovers that he has been losing.

But if you had a speedometer, the moment your speed slackened to less than 30 miles an hour, even though it were in the first mile, you would know you must make up this lost time if you are to get to Tarrytown in the hour.

Similarly in industry, we must know the costs from week to week or month to month, and always with reference to revenue, if we are to have any assurance as to how we will come out at the end of the year.

To know that the cost of something is \$5 or \$5,000 per day or per month is not sufficient. We must know costs in terms of a dollar of revenue, just as the motorist knows his mileage in terms of an hour.

The idea back of this form of expression of cost was presented in Mr. Taylor's use of the term "limit cost," and also in some of the later work of Mr. Gantt, but neither of them made a clear exposition of it or gave us a formula for its use.

My purpose is to apply this concept of cost to the problem of the chief executive, and to show how, through it and the formula which I shall give you, he may maintain a controlling knowledge of his enterprise comparable to that obtained by the motorist through his speedometer.

Before doing this, I must say a word about costs in general and the properties of certain elements of costs.

A. Elements of Cost.—There are two conflicting elements of cost, the confusion of which is at the bottom of a large part of our business troubles:

Variable Cost.—That part of cost which varies in proportion to the volume of business done.

Fixed Cost.—That part of cost which exists irrespective of the volume of business done.

If we divide our costs into these two elements and think of and deal with them separately, we avoid many dangers which result from confusing them.

The term "fixed charges" is ordinarily used to indicate interest on bonded or other indebtedness having the right of foreclosure in the event of not being paid. It is very seldom figured as an operating expense, for the reason that it has no relation to the extent or nature of the operations. The theory is that all other expenses are more or less affected by the extent or nature of the operations.

The fact is that there are a number of expenses which are just as fixed in every sense of the word as interest on mortgage indebtedness, and by overlooking any one of these we create the very confusion which we seek to avoid in segregating interest on mortgage indebtedness. If we are consistent in dividing all our costs into the foregoing elements, we find our whole problem of administrative accounting wonderfully simplified.

If the variable cost differs in amount according to the volume of business, but is always the same per cent of the business done, while the fixed cost stays fixed regardless of the volume of business, then the difference between the per cent of variable cost and 100 per cent (as representing the business done) may be called the contribution to fixed cost and profit.

In other words, if the variable cost is 75 per cent, or 75 cents out of each dollar of business, there must be 25 cents out of each dollar of business applicable to fixed cost until it is offset, and thereafter to profit; and if the fixed cost should be \$10,000 a week, it will take a business of four times this amount, or \$40,000 in each week, to break even; and we shall make or lose 25 cents on each dollar of business more or less than \$40,000 in each week.

To make sure that we have a common understanding at this point, I ask you to set aside your own and the dictionary meaning of three phrases, and to accept the meanings which I shall give.

Exhibit A—Subdivision of Cost for Purposes of Standards and Operating Reports.

Q.—Assuming the fixed cost and variable cost to be as indicated at the top of Exhibit A, how much business would it be necessary to do to break even?

A.—If the variable cost is 80 cents of every dollar of sales, obviously there is only 20 cents of each dollar of sales applicable to fixed cost. Therefore, to find the breaking point, or point at which there will be neither profit or loss, we divide 20 cents into \$120,000, which gives us the answer of \$600,000 per month as the breaking point.

.20)\$120,000 \$600,000 Q.—Assuming the same conditions, if certain economies are affected which reduced the fixed cost \$40,000, how much business will it be necessary to do to break even?

A.—This means that the difference between the variable cost and each dollar of sales remains the same as before, 20 cents, but the fixed cost is reduced from \$120,000 to \$80,000; so we go through the same process, using however the smaller fixed cost. The answer is \$400,000 per month.

.20) \$80,000 \$400,000

Q.—Assuming the same conditions; if, instead of the economies in fixed cost, the variable cost is reduced to 70 cents on each dollar of sales, how much business will it be necessary to do to break even?

A.—If the variable cost is reduced to 70 cents on each dollar of sales, then we have 30 cents on each dollar of sales applicable to fixed cost. Accordingly, we divide 30 cents into \$120,000. The answer is \$400,000 per month.

.30)\$120,000

Q.—Assuming the same conditions, how much would our loss be if we should do \$500,000 business per month?

A.—Since we get a contribution to fixed cost and profit of 20 cents on each dollar of sales, we would have a total contribution of \$100,000 and since our fixed cost is \$120,000, we would lose \$20,000 per month.

\$ 50	00,000	\$120,000 Fixed cost 100,000 Total contribution
\$100,0	000.00	\$20,000 Loss per month

Q.—Assuming the same conditions, how much would our profit be if we should do \$1,000,000 business per month?

A.—Following the same procedure as in the foregoing question, we would make \$80,000 per month.

\$ 1,000,000 .20	\$200,000 Total contribution 120,000 Fixed cost
\$200,000.00	# 80 000 D64
\$200,000.00	\$ 80,000 Profit per month

To emphasize the full significance of this subdivision of costs, the next exhibit shows how four businesses, each doing the same volume of business—\$30,000,000 per annum—and making the same profit—10 per cent or \$3,000,000 per annum—might have very different potentialities.

## Elements of Cost

Fixed cost	\$120,000:00 per month
Variable cost	.80 per dollar of sales
Contribution to fixed cost and profit	.20 per dollar of sales

\$1.00

### DEFINITIONS

Fixed Cost.—That part of cost which exists irrespective of fluctuations in volume of business within a range of the smallest volume of business which there is reasonable probability of doing up to the practical capacity of the plant.

As rent; depreciation; salary of executives and a minimum number of accountants and clerks; payroll for shop superintendents, foremen, watchmen, etc.; property and corporation taxes; interest on funded debt; etc.

It should represent only such items and parts of items as are regarded as essential to the conduct of the business at the established minimum volume and are independent of fluctuation because of increase or decrease in volume of business.

Variable Cost.—That part of cost which should vary in proportion to the volume of business.

As materials; direct wages; supplies; upkeep; salary of minor executives, accountants and clerks; payroll of assistant shop superintendents, foremen, etc.; income taxes; interest on floating debt; stock dividends; etc.

It should represent only such items and parts of items as are not essential to the functioning of the business on the basis of the established minimum.

Under conditions of a falling volume these items should constitute a schedule for curtailments.

Contribution to Fixed Cost and Profit.—The difference between the variable cost and sales value at list.

#### EXHIBIT A.

Exhibit B—The Best Business.—The fact that an enterprise has earned 10 per cent on a business of \$30,000,000 is not in itself sufficient to warrant an opinion concerning what that enterprise can do on any other volume of business.

To say that an enterprise has a variable cost of 70 per cent and a fixed cost of \$6,000,000 means not only that it will make 10 per cent on \$30,000,000 of business, but also that it will break even on \$20,000,000 and will make different percentages

### THE BEST BUSINESS

Per cent of profit on a given volume of business is not a safe guide for the appraisal of an industry

The four following businesses all have the same profit of \$3,000,000 on \$30,000,000 of business, yet have different potentialities in the event of increase or decrease of business.

Four different businesses	A	В	C	D
Per cent contribution to fixed cost and profit	20	30	40	50
All Earn \$3,000,0	000 on \$30,	,000,000 Bu	isiness	
Variable cost		\$21,000	\$18,000	\$15,000
Fixed costProfit and loss	3,000 3,000P	6,000 3,000P	9,000 3,000P	12,000 3,000P
		220,000		
Sales	\$30,000	\$30,000	\$30,000	\$30,000
Different Brea	king Point	in Each	Case	
Variable cost	\$12,000	\$14,000	\$13,500	\$12,000
Fixed cost	3,000	6,000	9,000	12,000
Profit and loss	0	0	0	0
Sales	\$15,000	\$20,000	\$22,500	\$24,000
If Business	Falls to	\$25,000,00	0	
Variable cost	\$20,000	\$17,500	\$15,000	\$12,500
Fixed cost	3,000	6,000	9,000	12,000
Profit and loss	2,000P	1,500P	1,000P	500P
Sales	\$25,000	\$25,000	\$25,000	\$25,000
If Business I	ncreases to	\$35,000,0	000	1
Variable cost	\$28,000	\$24,500	\$21,000	\$17,500
Fixed cost	3,000	6,000	9,000	12,000
Profit and loss	4,000P	4,500P	5,000P	5,500P
Sales	\$35,000	\$35,000	\$35,000	\$35,000

<sup>1 000</sup> omitted throughout.

Ехнівіт В.

The best business is the business with the lowest variable cost consistent with a breaking point below the smallest volume of business which there is reasonable probability of doing.

of profit according to the amount of business done from \$20,000,-000 up to its capacity.

On \$25,000,000 it would make \$1,500,000 = 6 per cent On \$30,000,000 it would make 3,000,000 = 10 per cent On \$35,000,000 it would make 4,500,000 = 13 per cent

If I were given a choice of the four businesses shown on Exhibit B, assuming that the smallest volume of business which there was reasonable probability of doing was \$20,000,000 and that the practical capacity of the plant was \$35,000,000, I would select business B. If, however, there was probability of the business falling to as little as \$15,000,000, I would select business A; or if, on the other hand, there were little danger of its going below \$25,000,000, I would select business C or even D.

As is stated at the bottom of the exhibit, the best business is the business with the lowest variable cost consistent with a breaking point below the smallest volume of business which there is reasonable probability of doing.

B. Unification of Records with Reference to Responsibility. Exhibit C—Organization Chart.—No two or more men can function together effectively without an agreement and understanding concerning their respective responsibilities and duties. An organization chart is nothing more nor less than a conventional means of recording and making clear the responsibilities and duties of the persons constituting the organization.

If the organization chart represents the units of responsibilities and duties upon which the success or failure of the enterprise depends, then obviously it represents the units in which all costs and records should be kept if the chief executive is to exercise an effective control over the situation. If responsibilities and duties are assigned on one basis and records kept on another, one might as well try to check with a bushel basket something bought by the pound. That is what is unconsciously being done in many of the best organizations.

In making a report on a very large and successful organization, it was recommended that the classification of operating accounts be changed to conform to the organization chart. The chief executive insisted that he already had this, that there was an account in the ledger for each major production department and for the sales, purchase, accounting, and in fact, every department. He was somewhat annoyed and said he could not imagine how else one would keep one's accounts.

GENERAL LEDGER ACCOUNTING CLASSIFICATION FOR OPERATING ACCOUNTS	nches Manager Commodity A coordination bers Manager Commodity B coordination Manager Commodity B coordination out	86	Manager credits  Manager production Manager shops	Manager routing Manager cost Manager stores	Manager maintenance Manager distribution Manager sales information Manager advertising Manager merchandise Manager Commodity A sales	Manager Commodity A branches Manager Commodity A jobbers Manager Commodity B sales Manager Commodity B branches Manager Commodity B branches Manager Commodity B branches	C Davisson
Organization Chart	Manager branches   Manager jobbers   Manager jobbers   Manager stroot	Manager Commodity B sales   Manager branches Manager sales information Manager advertising	Manager merchandise			Manager shops Manager routing Manager cost Manager etores Manager maintenance	D. Consession of
Orga		Manager distribution Manager Commodity A coordination Manager Commodity B	coordination Manager development Manager	personnel Manager internal relations	Manager purchasing Manager finance Manager accounting Manager	credits Manager production	
				President and General	Manager		

Exhibit D—General Ledger Accounting Classification for Operating Accounts.—We have here the same organization units as appeared in the organization chart (Exhibit C), except that they are written in a single column as representing the operating accounts classification for the same organization.

When such a list had been made from the organization chart of the chief executive before mentioned, we asked that he send for his accounting classification and compare the two. He tried for a while to prove that they were in effect the same, but he soon acknowledged that they were not.

It is true that most organizations have their accounts so arranged that all expenditures ultimately find their way to some one or another major responsibility. But I mean something very different. I mean that every expenditure should go at once to that organization unit of which the head is responsible for the expenditure, and should stop there.

The name of the organization unit and the name of the ledger account should be the same, and they should be synonymous for John Smith or Bill Brown or whoever is in responsible charge of the organization unit in question. Further, no part of any expenditure for rent, insurance, interest or any other item which the organization unit head himself does not arrange for, and in effect pass the bill for, should be prorated to him; and no part of any expenditure for which he is responsible should be prorated to the unit of someone else.

The *individuals* to whom responsibilities and duties are allocated are the principal sources of success or failure. Unless records are kept in terms of these sources, the chief executive has no effective means of judging the results in terms of responsibility.

Not many years ago chief executives spent most of their energies in worrying and struggling over results. Today results receive principal consideration as a basis for determining causes. While the doctor of ten years ago treated rheumatism as such, the doctor of today analyzes back to and treats the teeth or digestion as the cause of the rheumatism.

In the same way the chief executive of the past studied the cost and effectiveness of departments as such. Today he studies the cost and effectiveness of the individuals charged with the duties and responsibilities which constitute the department.

<sup>1</sup> This does not mean that each responsibility can have only one account, but that each of such accounts as it may have shall have a prefix indicating

How often have you, finding the cost of certain results high, sought to place the responsibility for these costs and found yourself foiled at every turn by divided responsibility. Briefly stated, every expenditure should be definitely charged to the person having immediate responsibility for making it.

An accounting classification made by anyone other than the person who determines duties and responsibilities, or made in advance of the determination of duties and responsibilities, is prima facie an

ineffective accounting classification.

C. Setting of Management Standards.—Assuming that it has been arranged that all expenditures shall be charged according to the organization unit, which is merely another way of saying the individual directly responsible for the expenditure, how then is the chief executive to judge the expenditure? He obviously cannot go sufficiently into detail to have a valid opinion whether it should be, say, \$29,700 or \$32,500 for the month; yet the difference between these two figures multiplied by 10 or 100 responsibilities goes into a goodly sum.

What is needed is a budget or standard for each organization unit, which is another way of saying for each responsibility, which is easily adjustable to the varying conditions of industry. It is impossible to say in advance whether we shall do a business of one amount or another, and it is equally impossible to say what the price which we shall receive for our goods or the price which we shall pay for our materials will be. Therefore, a budget or standard, to be effective, must be adjustable in all these particulars.

The first standard which must be set is that for the expected volume of business in each of the various units of product. I cannot go into the method of setting this standard, because it is in itself a big subject, but it is now being done by every concern which has made much progress in the evolution of a conscious technique of management.<sup>1</sup>

One point, however, I think I should stress because there is considerable misunderstanding with reference to it; and that is that in setting such a standard the purpose is not to guess what the result will be, but to establish a reasonable expectancy by

<sup>1</sup> See Bulletin of the Taylor Society, Oct., 1921, vol. 6, No. 5, pp. 194-213.

the organization unit responsible for the expenditures charged to it. The fundamental thing behind the classification of an expenditure should be the responsibility for the expenditure rather than the expenditure itself.

which the actual result may be judged. This point cannot be overemphasized.

If you know certain conditions which should not exist but none the less probably will exist and affect results, even though you take these conditions into consideration in setting your standard, the setting of standards represents nothing more than a guessing contest and is of no value from a management standpoint.

The purpose of setting standards is to determine a reasonable expectancy under conditions which should and can be made to exist as constituting a yardstick by means of which you may measure the degree of effectiveness of the individuals to whom certain responsibilities and duties have been assigned.

Assuming that we have established our expectations in the matter of sales, which constitute our standard for sales, we may proceed to the setting of other standards on the basis of these sales. In the setting of the remainder of the standards there is no prescribed sequence, for each one is useless without all the rest. Therefore, let us start with material and direct-labor costs.

Commodity A 1: Material and Direct-labor Cost to List Price Revised to————

Item	Ouete	List price		Mai	terial cost	Direct	Material and	
	Quota	Unit	Total	Unit	Total	Unit	Total	labor to list
C Jida- A 1 A	05 700	e4 05	\$ 47,617.15	e 0075	9 17 10A 70	0 2440	e 0 074 01	F.470
Commodity A 1 A	95,390		1					
Commodity A 1 C	101.510						, , , , , ,	
Commodity A 1 D	15,915		· ·		,.		,	
Commodity A 1 E	5,773						,	
Commodity A 1 F	31,238		,				,	.4969
Total A 1	275,565		\$444,718.30		\$144,826.36		\$92,305.84	.5332
					.3256 to list		.2076 to list	

EXHIBIT E.

Exhibit E—Sales Quota and Material and Labor Costs by Groups. This exhibit represents a certain group of articles which we call Commodity A 1. All commodities should be grouped according to their general type and then subgrouped according to the proportions of materials and labor contained in them. In this particular group we have six articles. In the first column we have the symbols of the different articles, in the second the num-

ber of each article which we have set as the sales standard or quota, in the third the unit list price, and in the fourth the gross revenue to be received for the standard quantity at the unit list price. The footing of the fourth column gives us the total of sales, or the sales quota for this group of articles. In the fifth column we have the cost of the material in a single unit, and in the sixth the total cost of material for the quantity in column 2. The footing of column 6 gives us the material cost of the standard total sale of this group of articles. Dividing this by the total sale, we find that the cost of material will be 32.56 cents out of each dollar of sales. Direct labor is dealt with in the same way, and we find that the cost of direct labor will be 20.76 cents out of every dollar of sales.

In setting the value of the material and labor, the object is to set what it should be at certain prescribed schedules of prices. If you happen to know that certain departments, processes or people are wasteful or inefficient, do not make allowence for these facts. The purpose in setting standards is to determine not merely the fact of efficiency or inefficiency, but also the degree. Where formal time studies and material studies exist, these should be used. Where they do not, ordinary estimates may be used, but the advantage of the more accurate figures is much greater than their cost. The manner in which these costs may be adjusted from month to month as prices of material and wage rates change will be explained later on.

In the last column is given the combined cost of material and labor to each dollar of sales. The purpose of this column will be explained in connection with Exhibit M, page 109.

Exhibit F—Total Sales Quota and Material and Labor Cost.—
This exhibit represents a summation of totals of a number of separate sheets, like the preceding Exhibit E, each total representing a group of commodities. The figures in Exhibit F, which were taken from Exhibit E, are identified by an E in parentheses—(E).

The footings of Exhibit F show an average material cost for the entire list of commodities of 25 cents on each dollar of sales, and an average labor cost of 20 cents on each dollar of sales. The average material and labor cost is 45 cents on each dollar of sales. Certain groups range as high as 54 cents and one as low as 33 cents on the dollar. These represent extreme variations from average of 9 points up and 12 points down.

This difference in cost of material and labor constitutes the principal difference in total cost of the different groups of commodities. In order to appreciate fully the part which this record serves in the determination of price and policy, it might be well to refresh your mind concerning what may be termed common practice among the better managed concerns in determining individual prices within a large group of commodities.

COMMODITY SUMMARY: MATERIAL AND DIRECT-LABOR COST TO LIST PRICE Revised to————

Item	37 1 . C 1 . 4	Material	cost	Labor co	Material	
Toen	Value of product	Amount	Per cent	Amount	Per cent	and labor to list
Commodity A 1 (E)	(E) \$ 444,718	(E) \$ 144,826	(E) .3256	(E) \$ 92,305	(E) .2076	Œ) .5332
Commodity A 2	300,000	84,174	.2805			.4605
Commodity A 3	150,000	43,000	.2866	25,000	.1700	.4566
Commodity A 4	105,282	31,000	.2949	20,195	.1922	.4871
Commodity A 5	1,200,000	400,000	.3333	252,000	.2100	.5433
Commodity A 6	1,800,000	360,000	.2000	300,000	.1666	.3666
Commodity A 7	500,000	110,000	.2200	100,000	.2000	.4200
Commodity A 8	1,500,000	390,000	.2600	320,000	.2133	.4733
Commedity A 9	2,000,000	440,000	.2200	360,000	1800	.4000
etc.	etc.	etc.	etc.	etc.	etc.	etc.
Commodity B 1	4,000,000	1,347,000	.3367	850,000	.2125	.5492
Commodity B 2	1,000,000	230,000	.2300	200,000	.2000	.4300
Commodity B 3	500,000	75,000	,1500	120,000	.2400	.3900
Commodity B 4	1,000,000	160,000	.1600	172,000	. 1720	.3320
etc.	etc.	etc.	etc.	etc.	etc.	etc.
Commodity C 1	3,000,000	700,000	.2333	618,000	.2060	.4393
Commodity C 2	1,700,000	357,680	.2104	289,000	.1700	.3804
etc.	etc.	etc.	etc.	etc.	etc.	etc.
Total	\$30,000,000	\$7,500,000	.2500	\$6,000,000	.2000	.4500

Ехнівіт Г.

Unit sales prices are not always based upon unit costs, as is generally supposed; in fact, under our modern competitive system, costs are seldom considered until after a practicable sales price has been determined. In the average industry, such as I am now describing, the steps in making sales prices are as follows:

- 1. List all of the articles.
- 2. Determine the articles with which these will compete, and head up a column for each of the principal competitors.
  - 3. Fill in the price at which these competitive articles are sold.

- 4. Determine and fill in the price, under the circumstances of your sales campaign, at which you believe you can produce the desired volume of sales.
  - 5. Put down your own unit costs.
- 6. Review all of the facts and make such unit prices as you believe necessary to the end of producing the most favorable aggregate result.

With this procedure in mind, it will readily be appreciated that certain items may be priced so as to make them leaders and others may be priced high or low according to various particular circumstances.

Exhibit F constitutes the basic information upon which the unit costs referred to in item 5 above are based. It also serves in adjusting standards to current fluctuations in sales price and material and labor costs. This will be explained in connection with Exhibit M.

Exhibit G—A Flexible Budget.—This exhibit represents a budget covering the cost of exercising the responsibilities and performing the duties necessary to the supervision and direction of sales of Commodity A to jobbers.

Each item on this exhibit has been extended twice, once under "cost of minimum sales" (representing the smallest volume of business there is probability of doing), and once under "cost for maximum sales" (representing the practical capacity of the plant). The reason for this will be explained when we come to set standards; but, apart from everything else, the fact of having to set standards for two different volumes of business is a good check in itself.

The items of cost have been subdivided in each case under three headings, the meaning of which is explained at the bottom of the exhibit.

The reason for this subdivision of cost is because they present the items, in which we necessarily think, of cost in connection with the functioning of an organization unit of this character, and we are always seeking to resolve things into the elements of which they are composed and to avoid artificial subdivisions containing a variety of elements.

Whatever other subdivision of expenditures we might make would necessarily be composed of the following three elements: first, the individuals necessary to carry out the work; second, the physical things consumed in the doing of the work; and, third, the

services of one kind or another rendered by outside agencies for which we must pay. If these are the elements with which we must deal, why not simplify matters by accepting them as our subdivision of expense?

ORGANIZATION UNIT: Manager Commodity A Jobbers. LEDGER ACCOUNT: Manager Commodity A Jobbers.

Scope of Expenditure: Supervision and Direction of Sales of Commodity A to Jobbers.

Basis: Minimum Sales at List \$7,000,000; Maximum Sales at List \$14,000,000.

STANDARD: FIXED COST PER MONTH \$8,333; VARIABLE COST 11.50 per cent of SALES AT LIST.

Date Made: 12/5/20 By H. E. C. Add. C. L. B. Authorized L. P. K.

	Ду н. 2. О. Арр. О. н. В.				Authorized L. F. K.					
	Co	st for min	imum sal	es <sup>1</sup>	Cost for maximum sales <sup>1</sup>					
Items	Employ- ment	Physical	Service	Total	Employ- ment	Physical	Service	Total		
Jobbers' discount 10%			\$700.0	\$700.0			\$1,400.0	\$1 400 0		
Bad debts 0.1%			7.0	7.0			14.0			
Rebates and allow 0.1%			7.0	7.0			14.0			
1 Manager				12.0	\$ 12.0			12.0		
3 Territorial supervisors				15.0	15.0			15.0		
4 Secretaries	7.0			7.0	7.0			7.0		
5-10 Clerks	8.0			8.0	16.0			16.0		
1-2 Boys	.5			.5	1.0			1.0		
9-12 Salesmen	45.0			45.0	60.0			60.0		
Office supplies-stores		\$ 1.0		1.0		\$ 1.5		1.5		
Office supplies special		2.0		2.0		3.0		3 0		
Jobbers' sales literature		30.0		30.0		48.0		48.0		
Postage			3.0	3.0			6.0	6 0		
Telegraph			2.0	2.0			4 0	4.0		
Sales travel			22.0	22.0			29.0	29.0		
Executive travel			5.0	5.0			5.0	5.0		
Sales bonuses				21.0	42.0			42.0		
Executive bonuses				14.0	28.0			28.0		
Miscellaneous			3.5	3.5			4.5	4.5		
Total	\$122.5	\$33.0	\$749 5	\$905.0	\$181.0	\$52.5	\$1,476.5	\$1,710.0		

<sup>&</sup>lt;sup>1</sup> Expressed in thousands.

#### EXHIBIT G.

A recent experience illustrates a by-product advantage of making budgets of this character.

In connection with an investigation and report on an enterprise of considerable size, we recommended, along with other things, the

Employment.—Salaries, commissions and bonuses of every kind, from chief executive to laborer or office boy, when paid to an individual regularly employed by the company.

Physical.—All physical things purchased outright and consumed or disposed of in the conduct of the business, as raw and manufactured materials, supplies, printed matter, office stationery, etc.

Service.—All items in the nature of service rendered by others than regular employees of the company, as royalties, rents, interest, discount, telephone, telegraph, transportation, food, lodging, etc.

Caution.—In determining both the items and amounts in making of budgets, avoid the natural tendency to prediction. Keep constantly in mind the essential fact that the task is to set a standard of what can and should be done rather than what will be done. Avoid reference to past experience until you have first determined tentative standards on the basis of practical possibility. Past experience should be used as a test and not as a basis.

making of budgets similar to this exhibit for each organization unit.

In talking with one of the executives about six months later, he said that the company had made a substantial reduction in its clerical and miscellaneous expenses in the process of making these budgets; that the chief executive had made each one of them figure out with him why it should cost so much to fulfil the different responsibilities and duties he had assigned, and had expressed some surprise that we had not said anything of the possibility of this saving in our report.

To have criticised the department heads for their clerical and miscellaneous costs would have accomplished nothing. In doing so, we would have been dealing with a result. Our recommendations dealt with the causes back of the result.

D. Formula for Expressing Unit Costs in Terms of Per Cent of Sales. Exhibit H—Operating Standards.—The first column of this exhibit is a list of the organization units, which is merely another way of saying a list of the individuals to whom the responsibilities and duties necessary to the conduct of the enterprise have been assigned. You will remember we are using these as the accounting classification.

The figures under the heading "Range" are taken from Exhibit F and a number of sheets, one for each organization unit, like the preceding Exhibit G. The figures taken from these particular exhibits are indicated by the initials (G) and (H) in parentheses in the left column.

The figures under the heading "Cost standards" are computed from those under "Range" by the formula referred to in connection with Exhibit  $A.^1$ 

The purpose of this formula is to enable one to determine the dividing line between fixed cost and variable cost. In other words, given the total minimum and total maximum cost for the conduct of an enterprise or any unit of it, this formula furnishes a means whereby one may determine what part of such cost is fixed and what part is variable within the meaning of these words as given in connection with Exhibit A.

The formula itself, expressed in everyday terms, appears at the bottom of this exhibit; but, to make it even clearer, I shall go over

<sup>&</sup>lt;sup>1</sup> In practice, the blank space in the top half of Exhibit H would be filled in. The figures between the double lines represent the aggregate of figures assumed to exist in the blank spaces above them.

## OPERATING STANDARDS—For Period January 1, 1921 to——— (Expressed in thousands)

		Ra	nge ′	С	Cost standards			
	Minimum		Maximum		Fixed		Per cent	
	Sales	Cost	Sales	Cost	Year	Month	Variable	
President and General Manager. Commodity A Coordination. Commodity B Coordination. Development. Personnel. Internal Relations. Purchasing. Finance. Accounting. Credits.								
Management	\$15,000	\$ 3,250	\$30,000	\$ 4,000	\$2,500	\$208,333	.0500	
Production Shops Routing Cost Stores Maintenance								
Production Overhead	\$15,000	\$ 3,250	\$30,000	\$4,000	\$2,500	\$208.333	.0500	
Materials (F)	\$15,000	\$ 3,750	\$30,000	\$ 7,500	none	none	. 2500	
Direct Labor (F)	\$15,000	\$ 3,000	\$30,000	\$ 6,000	none	none	. 2000	
Production	\$15,000	\$10,000	\$30,000	\$17,500	\$2,500	\$2083,33	. 5000	
Distribution								
Distribution Overhead		<b>\$</b> 635		\$ 1,070	\$ 200	\$ 16,667	.0290	
Commodity A Sales	\$ 9,250 2,000 7,000 250 5,750 4,000 1,000 750	490 905 57 16 840 175	14,000 500 11,500 8,000 2,000	770 1,710 94 22 1,280 330		17.500 8.333 1.667 .833 33.333 1.667	.0010 .1400 .1150 .1480 .0010 .1100 .1550 .1107	
Distribution	Т	\$ 3,250	T	\$ 5,500	\$1,000	\$ 83.333	.1500	
Footing	\$15,000 A	\$16,500 B	\$30,000 C			\$500.000 F	.7000 G	

Per Cent Variable Cost .- (D minus B) divided by (C minus A).

Fixed Cost .- (B minus A) multiplied by G.

Proof.—C multiplied by G plus E should equal D.

Ехнівіт Н.

the figuring to cover the total costs taken from Exhibit G (see line with (G) in left column) into terms of fixed cost and variable cost.

If we deduct the minimum sales from the maximum sales, we find that there is a variation in sales of \$7,000,000. If we deduct the minimum cost from the maximum cost, we find there is a variation in the cost of \$805,000. If we divide the variation in sales into the variation in costs, we find that the variable cost is 11.5 per cent of the sales.

	SALES	Cost
Maximum	\$14,000,000	\$1,710,000
Minimum	7,000,000	905,000
Difference\$7,000,000)\$805,000(.115 per cer		,

The variable cost being 11.5 per cent of the sales, if we take 11.5 per cent of either the minimum or the maximum sales and deduct that amount from the corresponding total cost, the difference must be the fixed cost.

Sales Multiply by per cent of variable cost	MINIMUM \$7,000,000 .115	MAXIMUM \$14,000,000 .115
Product is variable cost	\$ 805,000	\$ 1,610,000
Total cost	905,000 805,000	1,710,000 1,610,000
Difference is fixed cost	\$ 100,000	\$ 100,000

This gives us fixed cost of \$100,000 per year, or \$8,333 per month, with variable cost of 11.5 per cent of sales which we fill in on the line identified by (G) in the column "Cost standards."

With reference to the figures for materials and direct labor taken from Exhibit F, these figures, fluctuating uniformly with the volume of business, represent variable cost only; and, since the per cent of these figures with reference to sales was determined on Exhibit F, there is nothing for us to do but to fill in the per cents in the last column under "Cost standards." There is no fixed cost in connection with material or direct labor, so there can be no figures to be filled in.

From these examples it will readily be seen how all of the figures under "Cost standards" can be computed from those

under "Range;" and also that, when these figures have been filled in and are added up, we have the total cost for the conduct of the enterprise subdivided into the units of responsibilities and duties upon which the activities of the enterprise are based.

Having established a standard for each and every separate responsibility and having listed these standards and added them, the chief executive is informed not only of the facts that his total variable cost should be 70 cents of each dollar of sales, his fixed cost should be \$6,000,000, that he must do \$20,000,000 business before he can commence to make anything and that, thereafter, he should make 30 cents out of every dollar of sales, but he knows exactly what part each responsibility should play in obtaining these results.

You will have observed that all subdivisions of expenses as between a number of different accounts have been done away with. Rent is all charged to the organization unit responsible for relations with the landlord, insurance to the organization unit responsible for relations with the insurance agent and so on.

Under this plan the only journal entries to be made at the end of the month before an operating statement can be made are those which are common at the end of every month; that is, those in connection with depreciation, fixed charges, etc. Therefore, if all expenditures clear through a voucher register, as can easily be arranged, there is no need for waiting at all, beyond the writing up of the first-entry books, for the chief executive to have actual figures corresponding to each of the established standards.

You know what it is to wait until the middle or the end of the month for an operating statement of the preceding month. This wait is usually because it is desirable to get a trial balance and to make a number of closing entries dependent upon the current expenditures of the month, before making a statement.

In accordance with the methods described, all that you have to know to make an operating statement is the amount of the debit and credit charges for the month subdivided according to the organization units responsible for the transactions out of which they have grown.

The setting of standards by means of which any particular month's operations may be judged is merely a matter of a computation of fixed cost and variable cost according to Exhibit H, on the basis of the volume of business done, the price received for the product and that paid for materials and labor. How these

adjustments are made will be shown in connection with the next exhibit.

This covers the three basic principles which should underlie any method of management through which the chief executive can exercise effective control:

- 1. The expression of all results in common terms, that is, so that the statement of the chief executive is literally merely a copy of the last lines of the statements of those to whom he has delegated responsibilities and duties, added together.
- 2. The classification of expenditures according to responsibility for each transaction out of which they have grown, as distinguished from the nature of the expenditure itself.
- 3. The establishment of flexible standards which are readily adjusted to changing conditions in volume of business, price of product and cost of material and labor.

Organization Unit: Manager Commodity A Jobbers. Ledger Account: Manager Commodity A Jobbers
Scope of Expenditures: Supervision and Direction of Sales of Commodity A to Jobbers
Variation from Standard: \$8,333 per month Fixed Cost and 11.5 per cent Variable Cost

	Sales		Actual cost		Standard cost		Variation to date			
Months					Diama	ru cost	Good		Bad	
	Month	To date	Month	To date	Month	To date	Amount	Per	Amount	Per
				*****						
- 1		\$1,000,000				1		.0010		
February	1,000.000					,				.0010
March	750,000	2,750,000	98,583	347,249	94,583	341,249			6,000	.0022
April	1,000,000	3,750,000	128,333	475,582	123,333	464,582			11,000	.0030
May	750,000	4,500,000	100,583	576,165	94,583	559,165			17,000	.0038
June	1,000,000	5,500,000	128,333	704,498	123,333	682,498			22,000	.0040
July	500,000	6,000,000	76,833	781,331	65,833	748,331			33.000	.0055
August	1,000,000	7,000,000	129 333	910,664	123,333	871,664			39,000	.0056

EXHIBIT J.

E. Use of Standards in Judging Managerial Effectiveness. Exhibit J—Unit Operating Reports.—This is an operating statement for an organization unit; that is, a certain group of responsibilities and duties. The "Sales" we get in the usual way, by adding the sales book. The "Actual cost" we get, as just explained, by adding the corresponding column in the voucher register book. We do not have to wait for journal entries to be made, the ledger to be posted or for a trial balance to be taken off.

With reference to the "Standard cost:" Turning to Exhibit H we find that the fixed cost of this organization unit (the line

identified by (G) in the left column) is \$8,333 per month and the variable cost is 11.5 per cent of the sales. You will note that these figures have been filled in on the third line of the heading of this exhibit.

Dealing with the "standard cost" for the month of August, by which we mean the total standard costs for the volume of business done in August, we find that the sales for the month were \$1,000,000 and that 11.5 per cent of this is \$115,000, to which we must add the fixed cost of \$8,333, giving us a total for the month of \$123,333.1

	Month	To DATE
Sales	\$1,000,000	\$7,000,000
Per cent variable cost	.115	.115
Variable cost	\$ 115,000	\$ 805,000
Fixed cost		
m		
Total cost	<b>\$</b> 123,333	\$ 871,664

The "To date" can be computed by adding the standard for the various months, or by taking 11.5 per cent of the sales to date and adding eight times the monthly fixed cost, as is done in the example given.

The "Variation to date" is the difference between the actual and the standard cost.

Actual cost	
Standard cost	871,664
Variation	\$ 39,000

You will notice that the "Variation to date" is given under two headings, "Good" and "Bad" (meaning good results or bad results), both with respect to amount and with respect to its effect upon the per cent of variable cost. The per cent of variable cost is determined by dividing the sales to date into the amount of the variation to date.

## \$7,000,000)\$39,000 .0056

The conventional departmental or unit operating statement shows the month's costs as compared with the preceding month and the same month last year; thus:

<sup>1</sup> Naturally, a statement made in this way, say, on the third of the month, is checked, say, on the twentieth of the month when all of these things have been done.

August, \$129,333. Previous months \$76,833. August last year, \$117,256.

August, \$129,333. One-twelfth last year, \$131,256. The difficulty with all such conventional reports is:

- 1. The conventional statement lacks a standard based upon the particular conditions of the month in question. In Exhibit J the standard is modified to meet the actual conditions of the month in question.
- 2. The conventional statement has no definite bearing upon profit and loss. Exhibit J shows definitely the effect upon profit or loss; in other words, August results increase the loss by \$39,000, or one-half of one per cent on the entire volume of sales.
- 3. Each conventional statement is independent of every other statement; they have no collective significance. Exhibit J is one of a series of statements, all of which when listed and added together constitute a statement for the business as a whole.
- 4. Even should we grant for the sake of argument that the previous month, the same month last year or one-twelfth of the total for the last year of a conventional statement constitute a standard, there is no subdivision of the item of which the standard is composed. The details for all statements like Exhibit J are shown on a corresponding sheet like Exhibit G.

The question has been raised whether the present variable cost ascertained in accordance with the formula here presented is really constant, as is assumed to be the case in setting standards for different volumes of business on the basis of fixed cost and variable cost previously determined.

The answer is that it is not if we mean to the last dollar and cent, but for practical purposes it is.

Take for example, Exhibit G and let us run down the items:

"Jobbers' discount" is obviously constant, in that it is itself a per cent of sales. The same is true with reference to "Bad debts" and "Rebates and allowances." While the actual will vary, the standard is constant.

The managers and territorial supervisors as part of the fixed expense will not vary, but the other salary items will vary according to the sales from the minimum to the maximum figures shown, and these variations will not be in direct proportion to the increase or decrease in sales. Assume, for example, that sales increase and we find it necessary to put on an additional stenographer and bookkeeper. The additional stenographer

and bookkeeper will probably suffice for an additional \$100,000 of sales, and therefore the cost expressed in terms of per cent of sales will be a little higher when we first put them on than it will be at the end of the period when the sales have so increased that we have to put on still other additional clerks. This is true of a number of the items.

On the other hand, in practical experience you will find that the various items seldom shift at the same point; so that, taking any organization unit of considerable size, you will find that the variable cost arrived at in the manner here described stays virtually at a constant per cent of the fluctuating sales, provided, of course, that the manager of the department is on the job and keeps his expenses at a minimum, a thing which the use of standards of this kind stimulates him to do.

The very making of standards in this way forces a manager to think through his problem and to see his expenses in terms of results.

Let us assume, however, that, after making the standard, he finds it impossible to keep within it. This simply forces him to go to the chief executive, explain wherein the standard is wrong and have a new standard made. This he will do the moment that he sees his costs are exceeding his standard, because he does not want to wait until the chief executive receives his statement and sends for him. This is another advantage of working against standards made in this way.

The opportunity for attributing differences between two periods to the differences in the periods is done away with. The chief executive is assured that his costs will be maintained substantially at the standard, or he will be informed of the fact while he is still on his way "to Tarrytown," as it were, and he still has an opportunity to speed up and make up the lost time. Without this business speedometer he would have to wait until his hour was up, and then it would be too late.

We can now go on to the statement which the chief executive himself receives. This statement, as already explained, is merely a tabulation including the last line of each of the monthly statements of the separate organization units.

Exhibit K—Conventional Operating Report.—Before showing the final statement under these methods, I am going to show you, for purposes of comparison, the conventional operating statement.

There are many modifications of this statement, but I think this one is typical of the large majority of the best.

With this statement, how is the chief executive to know whether or not the results are satisfactory in proportion to the conditions under which the business was done, or how to appraise the accomplishments of the separate organization units?

. Assuming that he does not consider the results satisfactory, and he secures from the bookkeeper an additional statement giving further details, how is he to appraise the expenditures for one item as against those of another? About the most that he can do is what is usually done, namely, to compare the results of the month in question with the preceding month and with the same period for the preceding year, and even then he only knows how one compares with the other. He does not know how either compares with a reasonable expectation. If the conditions between the two periods compared are different, if prices have gone up or down, if the firm has done more or less business or if materials cost more or less, how is he to reconcile these differences?

Typical Operating Report (Expressed in thousands)

Current	month	To date			
1921	1920	1921	1920		
\$2,500 230	\$3,000 250		,		
\$2,270 1,600	\$2,750 1,850	\$14,400 10,000	\$16,200 10,700		
\$ 670 520	\$ 900 550	\$ 4,400 3,500	\$ 5,500 3,700		
\$ 150 40	\$ 350 40	\$ 9,000 285	\$ 1,800 285		
\$ 110	\$ 310	\$ 615	\$ 1,615		
	\$2,500 230 \$2,270 1,600 \$ 670 520 \$ 150 40	\$2,500	1921     1920     1921       \$2,500     \$3,000     \$16,000       230     250     1,600       \$2,270     \$2,750     \$14,400       1,600     1,850     10,000       \$670     \$900     \$4,400       520     550     3,500       \$150     \$350     \$9,000       40     40     285		

Note.—This example is intended to indicate the character and form of the usual operating statement rather than the degree of detail in which it may be made.

EXHIBIT K.

His expenditures are arbitrarily divided among a variety of responsibilities, and even if he determine that his production, sales, delivery or some other item of cost is high, how is he to fix the responsibility for the high cost without endless analysis which is impracticable as a current procedure?

There is an interesting fact in connection with industry, and especially with the job of the chief executive, which is not generally recognized or understood; it is that most of the undesirable results come from lack of knowledge as to where the trouble lies rather than in the difficulty of removing it once the source is definitely located.

Exhibit L—Recommended Operating Report.—You will notice that the last column on this exhibit is exactly the same as the last column on Exhibit H; in other words, it is the *standard* per cent variable cost to sales for each of the different organization units or groups of responsibilities.

The column immediately preceding it is the actual per cent of variable cost of sales.

The difference between the footings of these two columns shows at a glance the total difference between actual cost and what it should have been. In this case the actual variable cost has been 1.14 cents of each dollar of sales in excess of the standard. Multiplying this by the volume of business done—\$16,000,000—we see that the variation from standard in terms of dollars and cents is \$181,000 to the bad (difference between footing of third and fourth columns from right).

Please note especially that this statement is literally made up of the last lines of the statements of the individual organization units, brought together. There is no reason for any uncertainty on the part of the chief executive as to where to turn his attention for the cure of the condition that he finds. All he has to do is to let his eye run up the column "Bad" for variation and he will see exactly which responsibilities have fallen below the standard. Having determined this, he knows exactly for whom to send, and when he comes before him all he has to do is to refer back to the budget for that responsibility—that is, the sheet corresponding to Exhibit G—to see in just exactly what item the excess expense was incurred.

If actual expenditures are subdivided under the three headings suggested in Exhibit G—payroll, physical things and outside service—so that they are comparable with the standard, it will not be difficult to find out whether the increased expense is justifiable or not.

# OPERATING REPORT—7 Months to August 31, 1921 (Expressed in thousands)

	Sales	· Cost		Variation		Per cent variable cost	
	at list	Actual	Stand- ard	Good	Bad	August	Stand
President and General Manager	,				·		
Commodity A Coordination							
Commodity B Coordination		1		,			
Development	ı						
Personnel							
Internal Relations							
Purchasing Finance	1				:		
Accounting							
Credits							
oreares							
Management	\$16,000	\$ 2,447	\$ 2,467	\$20		.0487	.0500
Production					,		
Shops					1		
Routing							
Cost							
Stores				!			
Maintenance							
Production overhead	\$16,000	\$ 2,517	\$ 2,467		\$ 50	.0531	.050
Materials	\$16,000	\$ 3,950	\$ 4,000	\$50		.2469	.250
Direct Labor	\$16,000	\$ 3,300	\$ 3,200		\$100	.2062	.200
Production	\$16,000	\$ 9,767	\$ 9,667		\$150	.5062	.500
Distribution							
Sales Information							
Advertising							
Merchandise							
	810.000	- 010	a ros				
Distribution Overhead	\$16,000	\$ 613	\$ 597		\$ 16	.0300	.029
Commodity A Sales	. \$ 9,250	\$ 21	\$ 16	3	\$ 5	.0015	.001
Commodity A Branches	2,000	428	420		8		.140
Commodity A Jobbers	7,000	911	872	2	39		.115
Commodity A Export	. 250	1	51	1 8 1		.1420	.148
Commodity B Sales	6,750		Į.	3	6	.0019	.001
Commodity B Branches	. 5,000				50		.110
Commodity B Jobbers	1,000				1	. 1350	.155
Commodity B Export	. 750	103	102	2	1	.1119	.110
Distribution	. \$16,000	\$ 3,170	\$ 3,060	\$21	\$125	.1565	.150
Sales	. \$16.000	\$15,384	\$15.200	\$91	\$271	.7114	.700
Cost	15,384		,,,,,,	102	7.77		
Profit		F 1 .			1		
1 folio	. 30 10 16	Equal to	n increas	e in No	A A co.	ata aa ah	OWY O

It may be justifiable for the current period, but may not be justifiable in the future, in which case the standard would not be changed. The chief executive would simply say to the manager that the additional expense was justifiable in this case but should not recur in the future.

If it was not justifiable, he would point out to the manager wherein he had been remiss.

If, on the other hand, it was not only justifiable but would probably recur in the future—if, in other words, there was a mistake in the standard—he would make the necessary change in the standard.

The question has been raised whether a statement made up in this way will check with the financial books. Let us see just what we have done. First, we have divided our expenditures according to the organization unit authorizing them. Secondly, we have left every penny of expenditure where it was first charged. There has been absolutely no diverting of expense from one account to another. Therefore, instead of complicating things, we have simplified them. All that we have to do is to add up the gross revenue, add up the expenses, deduct one from the other, and the difference is necessarily our profit or loss. (See foot of first column.)

What I have shown you may at first impress you as involving a great deal of detail work. This impression can result only if you are not familiar with the vast detail work involved in making up statements as they are usually made. It is safe to say that there is less paper work involved in the procedure which I have outlined than in any other procedure which makes even a pretense of giving accurate monthly figures.

It is impossible to answer all the different questions that will occur according to the character of the industry in which you happen to be experienced. For simplicity, I am sticking close to the one particular enterprise previously described. I think, however, I should explain what we must do if the amount of goods produced and those sold do not happen to be the same.

If production has been, say, \$100,000 list price in excess of sales, we should add the excess production at inventory cost to the profit as shown:

Profit as shown on operating statement	
Value of goods produced in excess of those sold	
\$100,000 × .55	55,000

age was a discount of the same

\$671,000

If sales had been, say, \$100,000 list price in excess of production, we should deduct from the profit as shown the value of the goods sold in excess of those produced at inventory cost:

Profit as shown on operating statement	\$616,000
Value of goods sold in excess of those produced \$100,000 × .55	
	\$561,000

Having shown the operating report compiled with a view to showing the operating effectiveness of the organization and the placing of responsibility for good and bad results, I shall recapitulate these same figures, compiling them with a view to furnishing information with reference to matters of policy; whether a change in price might be advantageous to the company, and the relative merits of groups of commodities, territories, methods of selling, advertising appropriations and the like.

Exhibit M—Commodity Report.—This exhibit gives the following information under two separate commodity classifications. There may be one or a dozen commodity classifications, as circumstances may make desirable.

Inventory Cost......Net cost of commodities available for distribution.

Basic Sales Cost.....Inventory cost plus the cost of general sales organization.

Branch Sales Cost....Total cost of commodities sold through company's own branches.

Jobbers' Sales Cost...Total cost of commodities sold through jobbers. Export Sales Cost....Total cost of commodities sold for export.

You will remember in connection with Exhibits E and F that sales values are based on list price rather than on net sales price. The discounts under different methods of distribution are treated as expense in making up the organization unit budgets as per Exhibit G, and in making up operating statements as per Exhibit J. This is to assure that the per cent of cost to sales price under different methods of selling will be comparable. If we used net sales prices and should give only 10 per cent to our own branches because we have to carry the branch cost, and 15 per cent to jobbers because they carry their own branch cost, the net results would be misleading. Under the method used, the figures shown in this exhibit for cost of goods sold under different conditions are comparable, and it is possible to see at a glance the relative merits of the different methods of distribution.

OPERATING SUMMARY EXPRESSED IN PER CENT OF SALES AT LIST 7 Months to August 31, 1921

Elements	Commo	dity A	Commodity B		
Elements	Standard	Actual	Standard	Actual	
Management	.0500	.0487	.0500	.0487	
Production Overhead	.0500	.0531	.0500	.0531	
Materials	.2500	.2469	.2500	. 2469	
Direct Labor	.2000	.2062	.2000	.2062	
Inventory Costs	.5500	. 5549	.5500	. 5549	
Distribution Overhead	.0290	.0300	.0290	.0300	
Commodity Sales Supervision	.0010	.0015	.0010	.0019	
Basic Sales Cost	.5800	.5864	.5800	.5868	
Branch Sales Supervision	.1400	.1440	.1100	.1200	
Branch Sales Cost	.7200	.7304	.6900	.7068	
Basic Sales Cost	.5800	.5864	.5800	.5868	
Jobbers Sales Supervision	.1150	. 1206	.1550	.1350	
Jobbers Sales Cost	.6950	.7070	.7350	.7218	
Basic Sales Cost	.5800	.5864	.5800	. 5868	
Export Sales Supervision	.1480	.1420	.1107	.1117	
Export Sales Cost	.7280	.7284	.6907	. 6985	

EXHIBIT M.

All the figures on this statement are with reference to variable cost, but because we know the fixed cost for each item and that the total fixed cost is \$6,000,000 a year, we are able to figure the effect upon profit and loss which any change in policy would make.

For the sake of clearness I shall work out the effect on profit if we should reduce the price on Commodity B 5 per cent, with the expectation of increasing the business an additional \$2,000,000.

The present variable cost of Commodity B, we shall say for easy figuring, is 70 per cent of sales. This leaves a contribution to fixed cost and profit of 30 cents. If we reduce the price 5 per cent, this would be 5 cents on each dollar of sales, which would leave us 25 cents.

		Prospective sales Prospective c o n t r i-	\$8,750,000
Present sales	\$6,750,000	bution	.25
Present contribution	.30	٧	\$2,187,500
	\$2,025,000		2,025,000
		price, provided it results	\$ 162,500

I have already said that few individual commodity prices are based on a uniform margin of profit. Most successful businesses are based on prices for different commodities which produce very different profits, yet which produce the greatest aggregate profit for the business as a whole.

Certain articles are sometimes sold at cost—or even at a loss—as a leader, to meet certain competition, to keep the plant going or for other reasons. Therefore, in order to work out the combination of prices to produce the greatest aggregate profit, we must know the cost of each individual commodity.

In Exhibits L and M we have used average figures. Therefore, to get figures for any one commodity, we must find the difference between the individual commodity and the average, and add or deduct this amount to or from the average.

Take, for example, Commodity A 1 A sold to jobbers. From Exhibit F we find the material and labor cost is 54.72 cents, but also from Exhibit F we find the average is 45.00 cents. The difference is 9.72 cents, which must be added to the average total cost of Commodity A sold to jobbers as shown on Exhibit M of 70.70 cents. This means the variable cost of Commodity A 1 A is 80.42 cents as compared with an average of 70.70 cents for all Commodity A items sold to jobbers. The contribution to fixed cost and profit is then 19.58 cents as compared with the average of 29.30 cents.

Again, let us see what the contribution to fixed cost and profit will be if we reduce the price 5 per cent. Since the figures are already on a per cent basis, it would reduce the contribution as many cents per dollar of sales as is taken off of the price in percentage. The contribution would then be 24.30 cents.

Again, let us see what the result would be if the cost of material and labor were increased, say, 10 per cent. Material and labor are 45 per cent of the total variable cost, so 10 per cent added to

them would be equal to 4.5 cents on each dollar of sales. The contribution would then be 24.80 cents.

Or if all of the foregoing possibilities were taken into consideration in connection with the same item, namely, Commodity A 1 A, the result would be as follows: Starting with an average contribution of 29.30 cents, we should deduct 9.72 cents to bring it to the cost of the individual item. This would leave us 19.58 cents. We should then deduct 5 cents, representing 5 per cent reduction in price, bringing it to 14.58 cents, and then 4.5 cents, representing a 10 per cent increase in cost of material and labor, bringing it to 10.08 cents.

It is not likely that all of these things will happen at one time to any one item, yet such things have happened within the past year. I have made these figures merely to show you the flexibility of figures when expressed in terms of fixed cost and variable cost.

F. Financial Forecasts.—Finance is too usually regarded as separate and apart from operating. Many concerns have gotten into trouble, especially in the last few years, through too complete separation of these two major functions. Actual records show that many of the difficulties of both large and small concerns alike result from operations on a scale beyond their financial resources. Whoever may have the direct responsibility for the broader phases of finance, the separate functions of finance should be delegated to certain organization units just as specifically as the separate functions of operating, and the effectiveness of one group should be followed as closely as the other.

Under ordinary methods of accounting, it is difficult to forecast the financial effects of operations, but with operating standards such as are contained in Exhibit H the financial results on any given basis of operation are comparatively easy to determine. We can forecast not only the profits and losses reasonably to be expected, but also the bank balance and credit position of the company at the close of each month for some months ahead.

Exhibit N—Forecast of Profit and Loss, Bank Balance and Credit Position.—In this exhibit we have a forecast of the financial effects of operations on the basis of the maximum sales given in Exhibit H. To make this statement, we need only to know, in addition to the information contained in Exhibit H, the subdivision of sales by months, which will already have been made in connection with the sales quota, and the experience of the company in the matter of collection of accounts receivable.

Forecast of Profit and Loss, Bank Balance and Credit Position (Expressed in Thousands)

l k	A	1, 594 500 2, 500 16, 000	3,400	794,814	980	T	
July		69		\$30	669		
e e	O	9 9 17.1		\$3,505 1,911	\$1,594	d	
June	A	600 600 3,500 11,500 12,500 116,000 11	3,400	\$32,705 \$3,505 \$30,794 30,725 1,911 28,814	95 \$ 1,980 \$1,594 \$ 1,980	L f	
-	0	\$ 161 \$ 160 1,200 1,000		\$2,781\\$3 2,686\3	95	ь	
May				2,2	99		
	A	33,	2,500	\$32,981 31,261	\$ 1,720 \$	L	
	Ö	\$ 300 \$ 11,200 200 200 200		2,920	161	А	198
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Responsibilities and ledger accounts	Assets	Management: Bank balance Bank balance Notes Receivable due February Notes Receivable due April. Notes Receivable due June. Accounts Receivable December 31 Accounts Receivable February Accounts Receivable February Accounts Receivable March Accounts Receivable March Accounts Receivable March Accounts Receivable March Accounts Receivable May Accounts Receivable June Income from outside investments. Discount on purchases Pryduction:	Materials and work in process	Total assets and collections	Net profit and bank balance	Liabilities	Management 20.8 + 5 per cent: Bank deficiency. Notes payable due January 10\$ Notes payable due March 5

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20,000 7,145 7,200 15	1,150 500 100 313	200 174 160	\$33,050	
800 20,000 7,145 150	625	125	\$31,000	
Accounts payable December 31. Increases to fixed capital. Supplishization Surplus Fixed charges fixed charges Obversing	oduction 20.8 + 50 per cent: Asterials Labor Depreciation Operating Stribution 64 + 15 ner cent:	Discounts. Reserves. Operating.	Total liabilities and payments Total assets and collections	Net loss and bank deficiency

EXHIBIT N.

The first column represents the major subdivisions of responsibilities and duties used throughout all of the statements—"Management," "Production" and "Distribution." Under each of these are listed the items through which these major responsibilities affect the financial statement.

The second column represents the status of the company as of December 31, and the double columns to the right of this represent a forecast of the status for each of the various months from January to and including June. Under each month the first column indicates "Assets" or "Liabilities," and the second column "Collections" or "Payments." The last column represents a forecast of the status as of July 1. This statement may be projected as far into the future as desired.

Dealing with the assets, the first item under Management is Bank Balance. This is shown as an asset on December 31, and as both an asset and collection in each succeeding month. In making a forecast on a prescribed basis it often happens, as in this case, that instead of a bank balance, there is a bank deficiency. A deficiency is shown under Liabilities.

The second item is Notes Receivable. They are shown as an asset on December 31, and in each month up to the date of payment when they appear also as a collection and thereafter disappear.

The third item is Accounts Receivable. They are shown as an asset on December 31, and in lesser amount in each succeeding month according to probable collections, computed on the basis of experience. The amount collected in each month is entered as a collection, and the balance carried forward as an asset to the succeeding month.

The expected sales and collections for each month are entered as accounts receivable and dealt with in the same way, each on a separate line.

The fourth item is Income from Outside Investments. These appear both as an asset and a collection in the month in which they are received.

The fifth item is Discount on Purchases. These also appear both as an asset and a collection in the month in which the discount is charged.

The sixth item is Fixed Capital. This appears in a lump sum as an asset under December 31, and also in increased or decreased amount as it may be added to or taken from in each month thereafter.

The first item under production is Materials and Work in Process. This appears as an asset on December 31, and in each succeeding month in increased or decreased amount according to the difference between the material and labor put into work and that represented by the work completed. In this exhibit we have assumed that the inventory will be reduced \$100,000 in each month.

The second item is Finished Products. These are shown as an asset on December 31, and in each succeeding month in increased or decreased amount according to the difference between production and sales. In this case production is assumed to be maintained on a uniform basis sufficient to take care of \$2,500,000 of sales at list in each month, whereas the sales are assumed to vary as indicated under Accounts Receivable. The variation in Finished Products is, therefore, 55 per cent¹ (being the Inventory Cost as shown on Exhibit M) of the difference between \$2,500,000 and the sales.

Dealing with Liabilities, the first item under Management is Bank Deficiency. This has already been explained under Assets.

Notes and Accounts Payable are dealt with in the same way as Notes and Accounts Receivable.

Increases to Fixed Capital are shown as a liability in the months in which they will be incurred, and corresponding amounts are added to Fixed Capital as an asset. They are entered as a payment in accordance with the terms of payment for the assets acquired.

Capitalization, representing the entire funded obligations of the company, is shown in one lump sum as a liability on December 31 and in each month thereafter.

Surplus is shown in the same way.

Fixed Charges are shown as a liability to the extent of \$50,000 in each month. They are shown as a payment in January and April. The January payment represents a dividend from funds available December 31. A like amount is shown as having been accumulated for payment in July.

Interest is shown as a liability to the extent of \$15,000 in each month. It is shown as a payment in such amount and such months as may be needed.

<sup>1</sup> In Exhibit N it happens to be computed at 60 per cent instead of 55 per cent as in Exhibit M.

Operations is an item representing the current expenses of operating the group of organization units coming under the general head of Management. The amount is shown under Liabilities in each month and also under Payment as circumstances may require.

Under Production, Materials are figured as a liability at 25 per cent of the monthly production quota of \$2,500,000 at list. As Materials and Work in Process as an asset are reduced \$100,000 in each month, this amount is also deducted from \$625,000 which otherwise would have been used. Payment for these materials is figured as being made in each succeeding month.

Labor is figured as a liability at 20 per cent of the sales quota.

Payment is figured as being made in the same month.

Depreciation is figured as a liability at \$100,000 in each month and is allowed to accumulate throughout the period.

Operations is an item representing the current expenses of operating the group of organization units coming under the general head of Production. The amount is shown under Liabilities in each month and also under Payment as circumstances may require.

Under Distribution, Discounts are figured as a liability and as a payment at 10 per cent of the sales in each month.

Reserves are figured as a liability at a fixed percentage of sales in each month. Payment is figured as being made in varying amounts from month to month as commissions and one thing and another for which the reserve is made become payable.

Operations is an item representing the current expenses of operating the group of organization units coming under the general head of Distribution. The amount is shown under Liabilities in each month and also under Payment as circumstances may require.

The Assets and Collections and the Liabilities and Payments are then added and the one deducted from the other, showing, as the case may be, Net Profits and Bank Balance under Assets, or Net Loss and Bank Deficiency under Liabilities.

I have purposely made this hypothetical forecast of such a nature that it shows bank deficiencies in certain months, so that you may get a sense of how unfavorable features of any proposed basis of operation will be shown up by making a statement of this character. With this statement before you, it is evident that you must either arrange for further loans at the bank or for making

more prompt collections. In practice, a shortage of cash in January would have shown up in a similar statement made prior to December 31, and provisions for meeting this condition would previously have been made.

I do not know whether I have made it clear just where I got all of the figures used in this statement. The amounts in the column, December 31, are assumed to have been taken from a statement as of that date. The amounts put down under Assets for each of the months are a projection of the figures of December 31, with the addition of the expected sales, income from outside investments and interest on purchases within the month. The amount put down under Collections is the amount expected to be collected from each of the various items within each month.

Under Liabilities, the amounts put down in each month are a projection of the December 31 figures with the addition of the costs for each month's operation based on the standards shown in Exhibit H. I have filled in fixed and variable cost as shown on Exhibit H after each of the three major subdivisions of responsibility—Management, Production and Distribution.

Thus the items affecting assets and liabilities, bank balance and credit position may be projected over any period on different bases of operations, and the best results under the circumstances determined. Such statements should be made monthly.

## CHAPTER VII

## SHAPING YOUR MANAGEMENT TO MEET DEVELOPING INDUSTRIAL CONDITIONS<sup>1</sup>

BY H. S. PERSON

In the conduct of any enterprise there is a major function, the responsibility for which resides somewhere in the organization, of determining future policy. In many enterprises this function may be regarded lightly, or even disregarded, on the principle that sufficient unto the day are the problems thereof; but in the larger enterprises, and in all well-managed enterprises of any size, it is not neglected. That is one reason for their good management.

The problem of future policy has many phases, of which the following come at once to mind: the commodities or services to be produced and sold; the quantities of these it is safe to attempt to produce and sell; the financial and technical equipment necessary; the technical methods of producing and distributing which shall be employed; the conditions of human cooperation which must be established in the enterprise. These, and many other major phases of policy not here enumerated, break down into numerous subsidiary, but also individually important, elements. The difficulty of solving the policy problem is not reflected in the simplicity with which these elements may be enumerated, for they are not clearly separable. but are complicated and intersect. Furthermore, solution of the policy problem requires measurements and estimates of clusive and changing governing conditions—the variable demands of markets for particular commodities and services; the variable strength of actual potential competition to meet these demands; the availability of financial and technical resources and changes in these; the availability of workers and the changing conditions of their cooperation; restrictions or regulations which may be imposed by governments, and so on. And thoroughgoing measurements and estimates of such things as these lead farther into the consideration of factors still more elusive;

<sup>&</sup>lt;sup>1</sup>Reprinted by permission from the Bulletin of the Taylor Society, Dec., 1922, vol. 7, No. 6.

changes in the habits, tastes and mental attitudes of peoples; the probabilities of new discoveries and inventions; changes in the social machinery for the conduct of industrial operations; that complex of conditions generally designated by the inclusive term "industrial conditions."

It is highly probable that an increasing number of enterprises will come to recognize that policy determination is a function which requires serious and continuous attention. It will involve the ascertainment of and analysis of facts concerning which executives have in the past had little interest, and it will involve—above all—much and careful thinking. It is questionable whether the American executive can be characterized as a thinking executive so much as one intuitional in reaction to immediate facts; he himself has been proud rather to consider himself the doer and go-getter par-excellence—he who acts and gets while others think. If he is what he believes himself to be, he is the natural product of his economic environment; but one question to be raised is whether there is not evident a sufficient change in the environment to make any such pride now unreasonable.

The particular phase of the policy problem which is to be here considered is presented in the question, "How must executives shape their managements to meet developing industrial conditions?" This question is fundamental, for a particular kind of management is an expression of decisions on many other matters of policy. The question is not to be understood as asking, "What new principles of management must be discovered and formulated to meet developing industrial conditions?" There are principles enough at our command—many more than have been generally recognized and utilized—to meet any conceivable conditions. We might change to a socialistic or communistic society and still be adequately served by the technical principles and methods already at industry's command. But under even moderately diverse industrial conditions we must utilize these principles and methods in different combinations, must weight them differently, in accordance with the requirements of particular circumstances.

Developing Industrial Conditions.—Let us give our attention first to developing industrial conditions. A first glance is reassuring. Bank clearings, car loadings, the production of basic commodities and merchandise distributions have increased;

stocks and bonds are more active; the spread between commodity prices has been reduced and, in general, a possible further long-run decline in commodity prices has been checked by price advances; there is an increase in employment and even in places a shortage of unskilled and skilled labor. Executives are reporting that they are "getting the red ink off their books"; and frequently optimistic utterances of captains of industry appear in the press.

But a second less superficial consideration of conditions causes us to hesitate to join those who believe "it is all over except the shouting." May not the projection of a curve into the future on the assumption of a continuance of the present rate of revival be a dangerous basis on which to establish managerial policy for the future? The more thoughtful and cautious fear so. When the activity to supply seasonal and terminable demand is eliminated, and particularly the intensive activity to supply the abnormal demand for fundamental necessities to which the exigencies of war denied satisfaction—for instance, construction and all the lines of industry attendant on construction—when it is observed that consumers' demands for a wide range of commodities and services are continuing to be hesitant and cautious, there is not left a sufficient amount of evidence to warrant a projection of the curve of industrial activity into the future at its present gratifying slope. This point of view is expressed by a careful special correspondent of a dependable New York financial paper in a report from New England:

The only inference to be drawn (from facts enumerated) is that the bulk of the consuming public has been cutting off one thing after another in order to make its income go as far as possible in the matter of the commodities which it considers essential. Briefly, there are indications of a shrinkage in the American standard of living, which perhaps does not augur well for a long continuance of the present upward trend of industry, so-called.

How many of us have not reduced our standard of living from what it was during the period of 1914–1921, and how many, because of personal circumstances, do not expect to continue to keep it reduced for some time to come? The demand permitted by the aggregate of personal circumstances is what makes the market.

A third and more penetrating analysis, this time of more fundamental conditions, is even disconcerting to those who believe it is all over except the shouting. During the past decade, as a result

of the study of earlier cyclic movements, we have learned that certain economic phenomena, such as the quantity of money and credit, have a definite relation to industrial activity. The store of money and credit influences prices and the price movement influences industrial activity. We should recall that the long period of accelerating industrial activity culminating in the frenzy of 1920-1921 was coincident with a long upward swing in prices; that, in general, industrial activity increases in intensity with an upward price movement, is stagnant when there is a downward price movement and is hesitant and uncertain in the early years of a new stable price level. Of course, the ideal condition is a fairly stable general price level, but when a condition of stable price level suddenly confronts an industrial generation which has become accustomed to a consistent upward price movement over a long period, the new condition of stability, because different from the accustomed, is upsetting to the individual, either as demander or producer, and it takes a considerable period. measured not in months but in years, for him to learn just what he can safely do both in purchasing and in producing.

During recent years some sound work has been done in the analysis of fundamental industrial conditions and tendencies. which has given a basis for policy determination more substantial than anything we had previously had. It may be observed that during the past three years of experience wholly new to us, the forecasts of these investigations have "called the turn" more accurately than the prophesies—or guesses—of business men. These investigators have succeeded in making some accurate measurements of basic elements which determine price conditions for a number of years ahead, and the safest judgment to accept is that, in the words of the Harvard Committee on Economic Research, "the present price level is substantially that around which the fluctuations of the business cycle must play" for the next ten years. I make my own private reservations to that broad statement, for I believe the Committee has failed to take into consideration the capacity of American managerial genius to increase vastly, when put to it under intensely competitive conditions, the quantity of goods for exchange which may be produced from a given combination of plant, equipment, materials and labor; but perhaps the Committee is wise in not taking that into consideration, for it depends upon the wills of owners and managers who are a conservative group when it comes to the adoption of new production methods. I think we should be wise to accept their judgment as the safest basis for

business policy.

Assuming that forecast to be correct, what is likely to be the effect of a new, high price level "around which the fluctuations of the business cycle must play?" Simply that you and I are, for a number of years, going to continue to be conservative as purchasers, and also conservative as producers. As producers, we are going to wait for demand and, as demanders, we are going to wait until we have adjusted our purchases to the new relation between our incomes and the cost of living. It is true that wages are settling at a new high level, but there still remain a large number of consumers whose incomes are not readjusted so easily and quickly, whose incomes are at present and will for some time continue to be adjusted rather to the old price level, and it does not take a very large bloc of maladjusted consumers to keep the market unsteady and uncertain.

The conclusion I would have you draw is that for, say, a decade, consumers' demand is likely to remain so hesitant and uncertain as to be out of proportion to our capacity to produce. It does not seem necessary for me to give any proof that the war has disclosed that our capacity to produce far exceeds anything we had believed it to be. I have talked with observing men who have covered the country from Maine to California, and they have reported that the most impressive single fact of their observations is the tremendous capacity of American industry to produce. David Friday has stated that one outstanding fact is the increase in our productive capacity during recent years, and that if the war has taught us anything it is that we allow a large part of that capacity to "run to waste through sheer idleness." Now if our productive capacity is so great, and if it can be made much greater simply by eliminating sheer idleness, and if consumers' demand is fairly certain to be hesitant for the coming decade, have we or have we not a really critical management problem confronting us?

From a Sellers' to a Buyers' Market.—Before considering the kind of management that problem is going to force upon us, however, I want to make one more, a fourth, analysis of present industrial tendencies, painting the picture upon a large canvas. Let us give the picture a striking American title—The Overland Trail—from a dominant sellers' market to a dominant buyers' market. We all appreciate that we are now in at least a tempo-

rary buyers' market; I am suggesting that we are on the trail to a dominant buyers' market, and that we are possibly already on the great divide. If we are, we shall learn to manage our enterprises differently.

A summary review of the industrial history of the United States should make it patent that we have been brought up in a sellers' market. We have been pioneers—explorers, appropriators and exploiters of a vast continent of extraordinary resources. It has been a California of '49, or a Klondike, on the scale of a continent and a century. The exploitation of resources which have always had an immediate world market and cash value, the appropriation of stores of capital and treating it as income, has given our population a geometrically increasing purchasing power. Consumers' demand has kept ahead of and pulled along producers' capacity to satisfy the demand. We consumers have crowded about producers with outstretched hands full of purchasing power, begging them to give us something we could wear, eat, drink, parade before our friends, or otherwise enjoy. We have been drunk with a hoard of wealth and we have spent it like drunkards. As producers, we bent every effort to satisfy this demand, and we have constructed for ourselves a tremendous productive equipment; as producers and distributors, we were willing to get while the getting was good.

But there comes a time in the history of an appropriating and exploiting people when they cease to be frontiersmen and appropriators; when the stores of nature's wealth are uncovered and appropriated; when future income through exploitation is capitalized at current values; when income becomes real income derived from productive effort and ceases to be in large part the appropriation of capital resources; when there emerges on the one hand a class of rentiers and on the other hand a larger class of laborers, clerks, subexecutives, major executives, merchandisers and others whose income is, on the whole, limited by the productivity of their efforts and whose consumers' demand power tends to become correspondingly fixed. In other words, industrial society tends to become more stratified and stable. There is, then, the danger of a period of maladjustment when technical equipment and productive capacity have overreached immediate demand, and when, if other markets are not sought, a buyers' market succeeds a sellers' market as the dominant factor in the industrial situation.

There were signs before the war that the industrial development of the United States was approaching that stage of evolution. Natural resources had become pretty well appropriated and capitalized—not only such resources as mines, forests and natural transportation routes, but also agricultural lands, for there was before the war an increasing proportion of tenant farmers, paying rent in cash or shares. Serious students were concerned over this tendency. Technical productive equipment was at the same time greatly increased, and there was no sign of a plan or even a clear intent to develop foreign markets. President McKinley's turn, just before his death, towards a reduction of the tariff obstacle to the development of foreign markets made no impression on the dominant political party, and there continued a period of tariff policy which culminated in the Fordney-McCumber bill. It seemed to thoughtful observers that the quarter century before the war was a period of conscious or unconscious "eat, drink and be merry, for today we are getting ours and tomorrow will take care of itself."

Then came the war, which was a tremendous shock to the industrial system. On the one hand it caused a still greater development of productive capacity, financed out of future earnings through the mechanism of bonds and taxation, and caused a coincident decline in consumers' demand (the frenzy of 1920 was but an unsubstantial flare-up), a decline which is likely to continue for some time because of the continuing heavy taxes and the maladjustments caused by the war. In short, the shock seems to have hastened evolutionary tendencies, which would have developed more gradually and with only relatively minor depressions, and to have thrown us suddenly upon a buyers' market which will last for some time and may be the beginning of a dominant buyers' market.

A buyers' market means, for industries which are not competitive, a more radical and restrictive control or regulation, for when buyers look long at the dollar before parting with it, they look longer at the conditions which create the necessity for parting with all of it; and it means, for competitive industries, a strife for the consumers' dollar which makes so-called competition on a sellers' market seem but a children's game. In view of all these considerations, there was never a time when management should have more concern over future policy—and over the quality of its future management.

Management on a Buyers' Market.—Management on a buyers' market is quite a different thing from management on a sellers' market. On a sellers' market selling is but order taking: on a buyers' market it must be real merchandising. On a sellers' market production is but the hasty and wasteful process of giving material things a form or other quality which will satisfy insatiable and not overcritical demand; on a buyers' market it must be more precise and economical. On a sellers' market financing is largely borrowing on the assumption of unexploited natural resources or an unexploited upward market; on a buyers' market it is a borrowing on demonstrable future earned profits. On a sellers' market the conduct of a business is easy and management is simple—in fact, there does not have to be any real management. But now that you appear to be face to face with a buyers' market and the necessity of developing real management, if you are to be successful in a most intense competition, if your competitor, instead of yourself, is to be the one to disappear in some readjustment of productive capacity to consumer demand, it is expedient for you to inquire into the nature of that real management.

The essential practical elements of the problem confronting that management may be summed up as follows: On the side of supply there is a tremendous productive capacity involving heavy investments of capital in more or less specialized equipment, to preserve the value of which will require a continuation of the lines of activity for which it was designed. On the side of demand there is a conservative and hesitant market—in fact a buyers' market—which will continue for a considerable period. This will mean intense competition on the part of management to find the individual consumers and to sell them. In that competition, selling price and cost of production will be critical factors. The hesitant market will tend to force selling price down, while higher prices of certain elements entering into cost will tend to keep that figure up. The fact cannot be disregarded that, as was the experience after both of our earlier great wars, wages have settled at a new high level, and that the strength of organized labor and new immigration policy seem sufficient to hold them there during such a period as will determine the success or failure of competing enterprises. It should be observed also that many of the basic materials of industry are more or less closely controlled, and that material costs are likely to remain high. Therefore, management will be faced by high prime costs

in the face of great pressure to reduce the selling price of fabricated products. The way out for the successful competitor appears to be this: to develop an inclusive system of management which will more than compensate for high prime costs by cost savings elsewhere, thereby effecting lower factory costs and making possible lower selling prices or making possible a higher quality of product at the original cost and selling price.

In the first place, that system of management will give more attention to long-run tendencies in the industrial environment. These matters will no longer be regarded as merely "theoretical"; they will be regarded as very practical. Certain major executives will give more thought to policy and general plans, and not permit themselves to become too much absorbed in operating details and worn out by late-afternoon worries. They will not confine their reading to the news headlines and market quotations of newspapers, but will read under the headlines, search for the facts and do some thinking of their own. They will find time forand consider as important as some of the things for which they now find time—the reading of magazines of fact and opinion relating to administration, management, economics, politics and industrial relations. They will have in their organizations a unit to study and interpret industrial statistics. In illustration, a major executive of a certain medium-sized plant inquired of the Taylor Society the other day where he could find a young man, a college graduate trained in economics and statistics, to study for him the periodic reports of statistical services, and interpret them for the management in terms of the particular business. enterprise is getting the jump on competitors.

That system of management, in the second place, will provide for a more accurate judgment of the market with respect to the demand for the commodities it has to offer, competitors' ability to supply the demand, and what share of the market it can have reasonable expectation of securing. It is with the consumer that the impulse for industrial activity begins—"the consumer is king"; but on a sellers' market consumers are so numerous and insistent that we forget the source of the impulse and come to believe that it starts with the producer. Under the competitive conditions of a buyers' market, managers will see this situation in true perspective. Managers will learn that they cannot afford to misjudge demand, either with respect to what it wants, how much of that it wants, or what share of it competitors will permit

a particular enterprise to provide. Excessive inventories are fatal on a buyers' market. An enterprise must avoid that by some unit of the organization, whether it be an individual or a group, which will make continuous and precise analyses of the market and provide the data for master plans and schedules. Call it what you will—market research, merchandise research, sales engineering.

In the third place, that system of management will set up in writing, on the basis of the data secured by market research, definite master plans, budgets and schedules of operations for a considerable period ahead, these being supported by definite and interdependent detail plans and schedules for the major operating departments—selling, production and financing respectively. These master plans and schedules, and these supporting departmental plans and schedules, will be standards of performance, goals to strive for, lines to which to hew. To do without such plans and schedules means guessing, taking chances, departments out of alignment, unbalanced inventories, higher costs—losses for which the consumer willingly pays the price on a sellers' market, but which, on a buyers' market, become a loss to the producer which he cannot afford when competition is intense.

That system of management, in the third place, will have to conduct its selling operations with more skill than it has ever displayed before. On a sellers' market the consumer seeks the producer; on a buyers' market the producer must search out the consumer and sell him, in the midst of a keen competition both of other producers of the same commodity and other uses of the consumer's dollar. Just as there must be no misjudgment of the market, lest there be unsold inventories; no failure to make precise plans and schedules, lest there be unsold inventories; so also there must be no failure to search out and sell to the estimated number of consumers, or there will be unsold inventories.

Are we able to imagine the detail changes which are likely to follow the development of the new merchandising? Is it not probable that there will be less of that advertising whose object is to create new wants, in satisfaction of which consumers would spend surplus dollars, and more of that advertising whose object is to convince concerning the quality of staple merchandise offered in competition for the limited supply of dollars? Will not the work of salesmen be something besides either mere order taking or mere psychological suasion; is not the salesman more

likely to spend more time searching out prospects; calling on prospects as well as established customers; skilfully displaying the merits of goods; rendering intelligent—even scientific—service; planning and scheduling his work? Will not the supervision of sales executives and their assistants be more comprehensive and more skilful—again, more scientific—than anything we have seen; salesmen better selected, better trained, their work better planned and scheduled and given more intelligent and effective support by the directing staff? Will not the channels of distribution be more carefully studied and more discriminately selected?

I have called attention first to market analysis, master plans and budgets, and selling, as conspicuous features of the new management not because they are superior in importance to other phases of management but because they logically come first—the point of origin from which to lay out the operations of an enterprise being the consumer—and because in the sellers' market of the past these phases have been most neglected. It is not to be assumed, however, that I attach less importance to better production methods as a feature of the new management.

The Production Problem Is Not Solved.—There are some who assert that the production problem is solved and that we should now give most attention to other phases of management. I believe they are too hasty in their judgments, especially if we are thinking in terms of a severe competition on a buyers' market. The production problem is far from solved. It is true that we know more about good production management than about good sales management, and that we have a body of production management principles and practices at our command which, if utilized, would eliminate waste, reduce factory costs and permit price reductions to an astonishing extent; but it is equally true that they are not generally utilized, and the educational task of bringing about their utilization in a plant is as difficult and timeconsuming a task as developing market analysis and improved selling methods. Perhaps more so, for the development of market analysis, master planning and selling is the problem of a small group of specialists, while the development of superior production methods is a problem involving the precise cooperation of many individuals of varying capacity for cooperation.

Furthermore, the more severe the competition the more important become good production methods. For in the final analysis,

no matter how accurately we gage the market, how precisely we prepare schedules of operations, how skilfully we sell, the greatest weapon in competition is the combination of a dependable product, a dependable service and a quotation lower than competitors, and it is superior production methods which contribute most to making this weapon possible. If you can safely and consistently quote a lower price for an identical commodity and have a reasonably good selling organization, your competitors will hold you in dread.

In the fourth place, therefore, the superior management of the next decade will develop the production department to a high degree of precision, in accordance with principles and methods already formulated and available. As some strong merchandisers secure their profits by taking discounts, so strong manufacturers can take their profits by eliminating waste—the waste of useless or unused plant; the waste of useless, unused or inefficiently used equipment and tools; the waste of unsuitable, inadequate or lost materials; the waste of inefficient methods; the waste of improperly chosen, improperly assigned, improperly instructed and inadequately inspired workers. Investigations and experiments will be conducted which will disclose the best equipment, tools. methods and materials for the fabrication of the product, and, on the basis of the discovered best details, will be established standards of product, equipment, materials and processing. Provision will be made for the maintenance of these standards, and, these once established and maintained, a control of operations through planning, scheduling and checking of progress will be possible, which, as has been demonstrated in too few but still an adequate number of instances, forges the competitive weapon of lower costs and lower quotations.

Finally, that management will win the cooperation of all the personnel of the enterprise, not as a matter of humanitarianism but as a matter of technical necessity. Without such cooperation all other provisions for excellence of management are impaired. The good will of the personnel is in many instances the determining factor in successful competition. The combinations of elements by which this good will is won may be different in different enterprises, but all will be identical in at least two respects: a group of elements which secure the personnel's cordial consent to the standards of all kinds which are established, and a

sharing of the product of combined effort through wages which satisfy the personnel as reasonable and just.

The entire personnel of an institution, from major executive to the latest recruit, should be a cooperating group of individualities—cooperating, in the sense that each must play a part in a system of operations; individualities in the sense that each should be an original source of inspiration and new ideas, and a creator of new methods which fit and promote the work of the system. Too many institutions simply inbreed. Individuals lose their individuality and the organization loses its vitality. The greatest asset of an organization is not plant and equipment, cash in the bank or even an organization of persons but a spirit of cooperation, an atmosphere of live interest in the best management principles and practice, an esprit de corps of search for wiser policies and better methods and individualities which have not lost the power of creation within cooperation.

It is not out of place to call attention to a special aspect of the new management—the utilization of a new type of executive. The long sellers' market of the United States has developed highly one particular type of executive—the forceful, acquisitive, go-getter type which drives straight to results regardless of methods and cost. But while the forceful, go-getter type of executive will always be essential, managers have come to realize that an organization must be balanced by the inclusion of the thinking, investigating, planning type of executive who surveys conditions and tendencies, formulates precise plans, establishes schedules and budgets, keeps departments coordinated, maintains precise control of operations, has regard for efficiency and economy of methods and all the time appraises progress and results in terms of plans. Even the go-getter executive, so useful in the early days of an enterprise, must become a thinking. planning executive after the enterprise is well established as a going concern. The thinking and planning type of executive will play a decidedly important part in the future.

In conclusion, it should be understood that I am not pessimistic concerning what I believe are likely to be the developing industrial conditions. At the worst, consider what has been said as a word of warning. In the long run our very capacity for production will solve the problem, as it has in the past solved it under comparable circumstances; but the restorative power of that capacity for production must be realized chiefly through a

regulation by better individual managements. We shall have short-time cyclic variations, but fundamental increasing prosperity for industry is general during the decade of correction of maladjustments to new conditions. Note, however, the significance of the words "for industry in general." In the probable readjustment through the competition on a buyer's market, some enterprises are certain to disappear, and they will be those particular enterprises which are satisfied with the management which is "just as good as the average," for that mental attitude almost invariably means managements which are poorer than the average. For a quarter century before the war even poorly managed enterprises were helped in their ascent to the heights of prosperity by the escalator of a sellers' market; now that escalator is out of commission, and the ascent to a new prosperity must be achieved in the good old-fashioned way-by good management muscles, good management lungs and good management brains.

#### CHAPTER VIII

### MASTER BUDGETS OF SALES AND PRODUCTION 1

BY E. E. BROOKS

From several angles and because of several conditions the Dennison Manufacturing Company is able to be of service to other concerns which may be in very difficult branches of business endeavor. The character of our merchandise makes it possible for us to do more than an ordinary amount of experimenting without endangering our business seriously. We are fortunate in being able to make of ourselves a laboratory test, as it were, for the benefit of other concerns. If a manufacturer of clothing should try to put into effect in his plant some quite radical experiment he might possibly invite disaster, if the experiment should fail; whereas, we have so many items that the experiment can be made to cover some which are comparatively unimportant without endangering the whole structure. This applies with equal truth to experiments in production as well as experiments in selling.

In order to show the importance of budgets, it is necessary for us to give a fairly wide view of the organization. It is one of the peculiarities of the present subject that an explanation of the organization behind the budget makes the explanation of the budget almost unnecessary. It is really true that the forces which have given rise to the necessity for a budget are the complete explanation of the budget with the exception of its mere mechanical details. A certain warning is necessary in connection with the making of experiments. There are a good many people who expect an experiment to prove a thing that is in their minds before they start experimenting. It is highly desirable, however, that an entirely different point of view should be maintained if experiments are to give the greatest amount of benefit to the experimenters; and that is that one's mind should be entirely open to the truth which may be shown by the experiment.

We also have a decided advantage over a great many concerns who make a comparatively small number of items, inasmuch as a

<sup>&</sup>lt;sup>1</sup>Reprinted by permission from the Bulletin of the Taylor Society, Dec., 1922, vol. 7, No. 6,

lesson which we may learn from one set of items is very often applicable to a great many others which may be quite unrelated in general aspect. We try to plan our business so that all facilities may be employed to capacity at all times. But we also plan to have our employees sufficiently versatile so that if a depression should hit us from one direction it will be possible to absorb the workers in that department into other parts of the plant. We have not yet reached the millenium, but at least we are nearer it than we were a number of years ago.

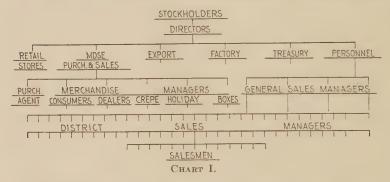
Then, too, we feel that we are able to be of unusual service to other concerns because of the light of publicity which has been thrown in our direction during these last few years by reason of a very wide interest in our industrial partnership plans. Never before has there been so much interest manifested in plans which affect the relationship of employers and employees. We believe that we have a great deal to gain by a careful working out of these plans, and that a very large part of this gain will come through the assumption of responsibility by the employees as a whole. The education of a large group of people is thoroughly interesting as well as thoroughly worth-while, even when that is measured in terms of dollars and cents.

A Variety of Products.—We make a wide variety of items—some 10,000 in all: shoe tags about 20 inches square and silk-strung jewelry tabs less than ½ inch square; shipping tags in several colors and baggage checks as used by the railroads the country over; marking tags of various kinds, of which hundreds of millions are used, and various kinds of gummed labels, of which billions are used; sealing waxes and crêpe papers; Christmas and Hallowe'en seals and tags; fine boxes for the jeweler and other high-class trades, and ring cases, made of fine leather, which show still another extreme angle of our many-sided business.

Most of these items are carried in stock in some form or other, and many thousands of other styles are made to order. Our 300 and odd salesmen call on many classes of trade, of which the principal ones are: first, the dealers, such as stationers who buy our goods to sell again. These are the people to whom you would go if you wanted a small box of gummed labels or other Dennison item. Second, the consumers, the people who buy our goods to use. These include the jewelers who buy our boxes and cases in which to deliver their pieces of jewelry, the railroads and industrial institutions that buy our tags and labels for many purposes

and the vast bulk of merchants of whatever class who have occasion to use some of the many products which we manufacture.

It is quite easy to see that we have an intimate contact with the people who are actually using our goods. Not only do our several hundred salesmen keep us posted on anything new which they are able to think up, but we also have four retail stores in the largest cities of the country, and from them we are able to get the point of view of the ultimate consumer in a much more intimate way than would be possible if we had to depend on the dealers' clerks. A suggestion, given while some woman is using our crêpe paper in the fashioning of a paper hat, may easily be very much more to the point than a multitude of similar suggestions coming through



a less intimate contact. This contact, which has made our crêpe paper work possible and which has been the means of decorating a vast number of people and articles with items made from sealing wax, is constantly bringing new uses for old items or suggesting a totally new merchandise.

A simple chart of our organization (Chart I) will show the place of the merchandise managers, and this is the point of view from which this subject is being discussed. Our merchandise managers assume part of the duties which are ordinarily associated with sales managers. The other part of those duties is, with us, assumed by the general sales managers. The merchandise men have direct charge of the creation, production and sale of merchandise as such. Insofar as this same merchandise may require to be sold by salesmen, the general sales managers assume control of the salesmen, their traveling plans, etc., concerning themselves mainly with the dollars-and-cents aspect of sale rather than with the merchandise aspect. This plan allows our

merchandise managers to give their undivided attention to the merchandise without having to concern themselves with problems of personnel.

Sales Policies.—A few comments on our selling policies will help you to understand the actual budgets when we come to them. We plan on a definite expansion of a certain per cent each year. In order to bolster sales in times of depression, we try to launch new merchandise. When sales are easy, we withhold the new ideas to save them for a time of greater sales resistance. We try to keep a reservoir of ideas so that a comparatively quick change in the general business conditions may be met from this reservoir. When sales lag in good times we put on extra efforts, perhaps conduct a sales campaign on certain items for which we have quite large facilities or stage some variation of a selling campaign with dollars-and-cents sales as the predominating factor. Our salesmen are sufficiently keen so that we secure a very good amount of cooperation in such campaigns, as was proved to our satisfaction by a recent sales effort which in a limited amount of time gave us orders for 100,000,000 extra gummed labels of a certain variety. We try to anticipate the dull times by developing new merchandise for those times and also by developing salesmen. This last method is the opposite of that adopted by a great many concerns which try to add salesmen during good times when business is easy to get, and let their salesmen go during the dull times when business is hard to get. By following the opposite rule we are able to go into a dull time with a staff of salesmen who have been particularly trained to anticipate an abnormal amount of sales resistance. During the early months of 1920, at which time we were obliged to withdraw practically all of our salesmen because of an oversold condition of our factory, we correctly anticipated the business depression of late 1920 and early 1921, and in the spring of 1920 added several dozens of new salesmen to our force and had them spend several months under the guidance of our senior salesmen in preparing themselves for the time which we felt sure was not far away when we would require every possible sale that could be made. As a result of this anticipation the depression which struck the company during the latter part of 1920 found us with an augmented and a trained sales force and we went through that next year with an employment roll which at its lowest was a fraction over 96 per cent of normal.

With this background we believe that you can more easily understand the actual budgeting of our sales and products and may also grasp the technique of scheduling items. We should emphasize the point that men of the selling organizations are directly in charge of our factory production and that this production is reviewed at least monthly, if not oftener. The schedule sheets (Chart II) will show you the mechanics, and you should particularly notice the amount of information which is available to the one doing this scheduling. For each item in our line we have the sales by months of the previous year plus the estimate for this year; plus the sales per month and the total

1922								
		DEC.	JAN.	FEB.	MAR.	APR	MAY	JUNE
ITEM								
	SCHEDULE							
	PRODUCTION							
ESTIMATE 1923	TOTAL					1		
REVISION 1923	SALES 1923							
ESTIMATE 1924	TOTAL							
MINIMUM RUN	SALES 1922							
	AVAILABLE							
	BACKORDER		1					

CHART II.—Drawing of section of schedule sheet.

sales for this year; plus the production by months and the total production for this year. There is also available, although not on this schedule sheet, the sales on these items over a period of a number of years. It is an interesting angle of this system that the individual items of a line seem to increase in almost exactly the same proportion. We may have a hundred silk-strung tags. for instance, and over a period of the last ten years, while the sales of the entire 100 may have varied 75 per cent from the sales of ten years ago, the individual sizes have not varied an appreciable amount from the general increase or decrease. This is true in so many directions that it can almost be taken as a rule for such items of merchandise. Our merchandise managers are so closely in touch with the sales of our items that such variations as may be pronounced will be discovered and either corrected or allowed for before the tendency to pile up stock or to run out of stock becomes serious.

Production and Sales Quotas.—In one important direction our problems are apt to differ from those of many other concerns. Our quotas on lines of merchandise are apt to be set by our producing ability. With us our production usually trails our sales because the market is far from saturated and our selling organization is able to find very many new or larger outlets for our goods. Our problem therefore is comparatively simple, because our ability to produce is usually less than our ability to sell. Despite the fact that our merchandise is so widely distributed, we do not believe that we have come within appreciable distance of the law of limitations, and we are sure that the public could easily and painlessly absorb several times as much merchandise as we now make. Even though our facilities were much greater, we should still believe that there would be tremendous value in the setting of definite quotas because of the incentive to be derived from hitching to a star. The pages of the advertising journals, for instance, are constantly telling us stories of concerns which have apparently reached the limit of distribution and which suddenly awake to the realization that they have been overlooking altogether new and very wide fields of distribution. We have not yet reached a height where we are willing to admit that the horizon which we can see is the ultimate limit, and we believe that the limits which are set by many manufacturers are self-imposed limits and are set because of a lack of perspective plus a lack of analysis.

The monthly schedule sheet and the enlargement of one of the schedules (Chart II) will show you how we try to keep in very close touch with every item of merchandise. The enlarged schedule is filled in as it would appear on March 1. On that date we revise the March schedule, if it is necessary to revise it; we revise the April schedule, if that is necessary; and we enter the figures for May (on some items where there are intricate manufacturing processes we schedule for the third month ahead instead of the second). If there is any emergency, such as a sale out of all proportion to any previous records, a merchandise manager is able to consider it with the factory division superintendent without any delay, inasmuch as both men are at one place. Thus the best thoughts of the selling end and the producing end are immediately available for the consideration of any problem which may come up. These pages come to us for review at the beginning of each month, but if some condition should arise during the

course of the month which would endanger our stocks, it would be reported at once and would be handled separately.

Back of the monthly schedule sheet is the yearly estimate, the figure of which, as it applies to each particular item, is entered in its proper space on the monthly estimate form. In one sense of the term we buy our goods from the factory just as customers do, and we are by no means certain but that the plan which we use would be of great advantage to actual customers if they would only use it. In June of each year we are called on to estimate our sales on every item of merchandise for the following year and we give to the factory our best guess as to what they will be required to produce during the next year. If we expect

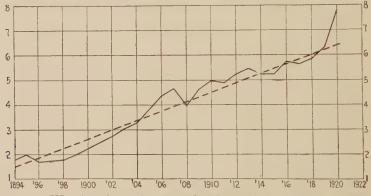


CHART III.—Actual growth compared with standard or planned growth.

to sell more than they are able to produce, they have ample time to secure new facilities, provided the directors will approve the order for those facilities. If the quantities that we anticipate selling are less than they are able to produce, we are notified to that effect, and we have a period of several months in which to plan sales campaigns on new items or to put into effect whatever may be necessary to bring the sales up to the production. You will understand that we are not content to set a mark for ourselves which is easy to reach. The sales quota for each important group of items should be in accord with a long-range plan of increasing sales. Thus we have to go back beyond the yearly estimate to consider a plan which has a general application over perhaps 25 years ahead. We have grown steadily through the years and we believe that it would be fatal for us to stand still. Also, we believe that we cannot increase our production beyond a

certain small percentage each year and still keep our production up to standard quality. The standard of growth is a straight line or a very slightly curved line, as Chart III will show, whereas the actual growth is apt to rise above or fall below the standard, due in the main to the rise or fall in the purchasing value of dollars and cents or to widespread business conditions which we may not have anticipated accurately or fully. Nevertheless, the standard is there and provides us with a quota which becomes higher each year and which therefore calls for a larger effort each year.

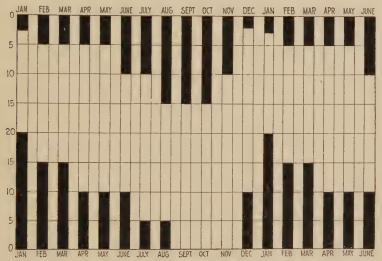


CHART IV.—Box department. The bars at the top indicate the scheduling of facilities to produce for special orders; the bars at the bottom indicate the scheduling of facilities to produce stock items; the white space between indicates the scheduling of facilities to produce for the firm's use; thus the capacity of the department is utilized every month of the year.

To those who manufacture for stock as well as to order, one phase of our plant will be of particular interest. We try to keep all our facilities going all the time, but we sell to a good many classes of trade where there are decided selling peaks and these must be taken into consideration in our manufacturing plans. This results in a flood of orders during certain months of the year, with corresponding drops at other times. We therefore try to develop our stock lines to the place where they will effectually balance the flood of special orders and Chart IV will show how we try to schedule the stock lines in comparison with the average

flow of special orders as it applies to the box division. Most of our boxes are sold to the jewelry trade, which is very highly seasonal. If we made only to order, we would have a tremendous peak during the fall months and a corresponding valley after New Years. We have, therefore, developed our stock items so that during these otherwise dull months they can be used to keep every facility going at full time. The space in between the heavy lines representing stock goods and made-to-order goods is taken up by the making of boxes for our own goods, such as are sold to the dealers or consumers. In this way we keep a flow of production in our box division which does not vary an appreciable amount, except that it tends to increase each year. The same method is used in each one of the producing divisions with variations in the plan to suit the particular needs.

A tremendous advantage of these plans in operation is that the selling men who are directly in charge of sales of merchandise are also directly responsible for the production of that merchandise. The merchandise managers are midway between the consuming public and the employees actually making the goods, using their best efforts to provide continuous employment for the employees and to provide sufficient merchandise to meet the demands of the consumer. The merchandise managers may be compared to a telephone central which is constantly receiving requests for connection from a multitude of people and is just as constantly giving connection with an equally large multitude. The merchandise manager is in constant touch with the needs of the producing end of our business and is just as constantly in touch with the consuming public. On our monthly reviews the slow sellers and the fast sellers are shown up with equal prominence and, while we have not attained a state of perfect bliss. we feel that we have made progress.

#### CHAPTER IX

# THE CONTROL OF AN INDUSTRY IN THE BUSINESS CYCLE<sup>1</sup>

#### BY HOWARD COONLEY

Human nature decrees that every executive shall believe his business to be surrounded by more difficulties and intricacies than could possibly exist in any other enterprise. Claiming no exception to the human rule, I am confident there is no more delicate problem of production and inventory control than that of the Walworth Manufacturing Company. As producers of pipe fittings, valves and tools made of cast iron, malleable iron, brass and steel, we are required to have ready for shipment at any time something over 23,000 different finished articles. In terms of completed parts, this means several times that number of items.

Our product goes to the building trades, to manufacturing plants, to the railroads, shipbuilders, oil fields and, in fact, to every line of activity, in quantity. Although new construction of buildings and equipment of all kinds plays a large part in our demand, by far the greatest tonnage is used in repair work, and therefore we are unusually subject to the necessities of quick delivery. We distribute this product, approximately 50,000 tons of finished material, through six of our own branches located in the largest distributing centers and through large jobbing and manufacturing customers.

We have two factories, one in South Boston which produces under normal conditions something over 1,000 tons of finished goods a month, and one in Kewanee, Illinois, a larger unit producing normally something over 3,000 tons monthly. The South Boston works ships to the territory east of the Alleghenies and to our export customers; Kewanee works covers the territory from the Alleghenies to the Pacific Coast. In general, the assortment of material produced at both plants is approximately the same.

<sup>&</sup>lt;sup>1</sup> Reprinted by permission from *Harvard Business Review*, vol. 1, No. 4, July, 1923.

At the time of my becoming president, the Walworth Manufacturing Company in 1913 had only one plant located in South Boston and their sales were approximately 15 per cent of our present volume. Since the number of items which they were producing and storing was the same as at present, their production and inventory problem was fully as difficult. The methods used in ordering material were characteristic of those followed generally at that time—namely, to give a blanket manufacturing order to the superintendent when a shortage occurred and leave to his off-hand decision the determination of the quantity to produce. No background of records was available on which to predicate a planning system. Figures showing the company's condition were available only once a year. No estimate was possible of the current monthly profits, and there was no classification of the product.

#### I. DEVELOPMENT OF COST ACCOUNTING

Realizing the vital necessity of a more definite system of accounts to make possible an accurate method of control, we determined as a first step to divide our product into major classes and to use this classification in all our accounting. As a second step we decided to reconstruct our sales and production records over as long a period as was practical, and to use this information as a basis for a budgetary system. The necessities of war and the changes in the company's activities delayed the time at which our budgetary system could be started, and it was not until the year 1922 that we obtained the full advantage of control methods which are now a permanent and basic part of this company's policy.

For purposes of both accounting and production control, we had decided to divide our product into 15 groups and to break these groups down into 38 classes. From the time materials are put into production to the time they are billed to our customers, these classifications are maintained. By use of these classifications through the summary accounting records, we can follow the movement of goods, through raw material and work in process, until they have passed out of our control into the market. The simplicity of such a cost accounting system is one of the great aids to interpretation of the productive processes going on within the company.

#### II. CHANGES IN ORGANIZATION

While this simple cost accounting system was thus being developed, there was also in progress a simplification of the organization. It was not an easy matter at first to define clearly the functions of the major executives. Of course, as is the case with many companies who first approach such a problem in organization, it is found that many persons are attempting to do the work which others feel should come within their jurisdiction. Lack of definition is bound to bring about much overlapping of duties. When this overlapping was eliminated from the major functions, we arrived at an organization showing three line vicepresidents—one in charge of production, one in charge of sales and a third in charge of all administrative functions. And since our business has many technical aspects, a fourth vice-president in staff capacity heads up all functions pertaining to engineering. There are also, of course, the other usual corporation officers secretary and treasurer. Therefore, six officers in contact with the president's office assume control of all branches of the business, each being given full authority in the direction of all activities within his control, and being held responsible for financial results, which our revised accounting system makes it possible to segregate.

It was naturally necessary, in turn, to break down the activities coming within the jurisdiction of each of these vice-presidents, so that every subordinate would know his authority and responsibility. The major executives under the vice-president in charge of production, for instance, are the Boston works manager and the Kewanee works manager. Under each of these managers is a complete but distinct organization, and the accounting system is arranged to correspond with the authority of these officers. Each works has its own accounting records based upon the division into 15 groups and 38 classes, so that we may check costs and efficiencies between the two works on a comparable basis.

This plan of organization and the development of an adequate cost accounting system had but one ultimate end in view. The company, which was developing rapidly, must for control purposes be just as easy to comprehend as the original smaller organization. Responsibilities must be so clearly marked that there could be no sidestepping the results as indicated by the accounting records. And thus was laid the foundation for a budgetary

control which should make possible a ready indication of the present status of the business and its future trend.

## III. RELATION OF WALWORTH BUSINESS TO THE BUSINESS CYCLE

Now as this development was progressing, the facts about the business, which had been simply guessed at before, began to accumulate and shape themselves into definite "rules of the business." We began to see that there was some rhyme and reason behind the past fluctuations in the business, and before long it seemed wise to inaugurate a statistical section which could run over the gathering figures and interpret them. Just how extensive the activities of this section would become was not definitely laid down. At first it was simply thought that something could be accomplished toward finding out where the Walworth business stood with relation to general business. Some publicity was being given at that time by certain economists to the theory that each business had its own cycles just as distinctly as general business. These economists suggested that any industry might find out its own cyclical changes and learn whether its movement was severe or easy. Furthermore, they suggested that the individual industry would probably find that its cycles corresponded in point of time with the cycles of business in general. It might discover that its particular volume reached its high or low point earlier than general business; or, again, that the general business situation developed a definite number of months in advance of its own varying conditions. But the first and most important suggestion they made was that if each business knew that it was affected in response to general business conditions, and could establish its position with regard to the general business movement, it would have a sure index of changes of policy that should be made to meet its own changing conditions.

This suggestion was in line with our own attempts at more definite control, for, with the newly established organization and accounting methods to give us the facts, we needed only an indicator to tell us how to make maximum use of them. So the planning and statistics section had cut out for it an initial field of activity. The facts already at hand, compiled by the accounting department, became its raw material and, even though the

accounting plan had not yet been fully developed, there was much work that could profitably be done.

The first experiments showed that a Walworth cycle did exist and that it was very marked. A curve representing this cycle action by a very simple statistical process was worked back as far as 1890, on the basis of records available in the treasurers' office. There seemed to be a fairly logical sequence over a period of a few years, and this sequence seemed to repeat itself continuously. It is true that there was no definite clock-like action in the length of time consumed by our business cycles, but there was a very definite cycle movement. The theory of the economists seemed to be working itself out in practice.

There had been for some time many advice letters coming in from business forecasting agencies, which had been read with the usual casual interest by most of the executives. The planning and statistics section requested that all these letters, after they had been read, be forwarded to its files, so that at leisure they might be reviewed and made further use of. Instead of going into the waste baskets of the executives, these letters became the text-books of our investigators. As the staff became better acquainted with the good advice available, it seemed unprofitable not to make some tangible use of it. A very short study, in fact, made it apparent that our effort would be successful.

In every instance we found some similarity between the Walworth business curve and that of the barometers under investigation. The variation was greater in some instances than others, but there were in each some comparable elements. We did not, at the time, hope to find any curve which exactly paralleled our own. But we felt that if we could discover one which in the past had preceded or followed our own by a definite period, we could then accept the advice which that agency might give and adjust our plans forward or backward the exact number of months suggested by past experience. It was essential, however, that the number of months be very definite in order to provide a sound basis for policy planning and control purposes.

It was with great satisfaction, therefore, that we began our study of the Harvard Economic Service issued by the Harvard University Committee on Economic Research. Their method of presenting business cycles seemed at first a little technical, but a short study proved it easy to comprehend, and their charts

indicating current status of business were much more definite in their forecasts than any others we had found. It was but a simple matter to change our cycle curve to a form which would enable a comparison with the Harvard B curve. The accompanying chart illustrates how this was accomplished. Figures for the same 12 pre-war years covered by the Harvard B curve were available. The war threw all barometers so far out of line that we did not attempt comparison during that period, but picked up the thread in 1919. It is generally conceded that more is to be learned with reference to normal business cycles from the pre-war years than from any later ones, and fortunately our records, though meager, supplied sufficient data to enable us to plot our line back to 1903.

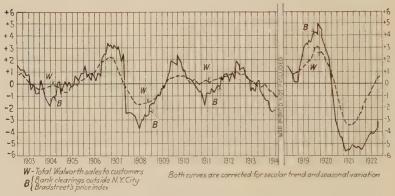


CHART V.—Walworth sales index and the Harvard "B" curve.

There are three index lines on the Harvard chart and it would have been possible to attempt to compare our curve with any one of these. Had our business been speculative in nature, it would have been better to attempt correlation with the Harvard line representing speculation; or had it been primarily financial, we would have turned to the banking index for our comparison. But our industry is one of the bread-and-butter type of average business, so that it was evident from the first that the composite of the factors which control general business, the Harvard B line, was the one we should follow. The chart will show that our study was rewarded by finding an astonishing similarity between this B curve and the Walworth line.

It is probably a matter of coincidence that our high point comes in almost exactly the same month every time as the B-line high point; and our low point is reached in almost the same month as the low point of the Harvard B line. The only exception to this seems to be that in the years 1903-1905 we had two low points, with the "half high" point in the middle of 1904. We did not trouble ourselves to explain why we acted differently in this case from general business. Possibly in the middle of 1904 the company cut prices too low and got in some extra business, but if some exceptional reason like this had been eliminated so that the sales were evenly distributed over 1903, 1904 and 1905, the low point would have accurately tallied with the B curve. The important fact which we observed was that this condition held true after as well as before the war. again, we found greater confidence in the Harvard curve than in other barometers, because no other that came to our attention showed a clear-cut cycle action in general business resumed in 1919, while the Harvard curve made evident the fact that the normal cycle was resuming its activity in that year.

A close study of the chart will bring out one essential difference between the pre-war and post-war curves—particularly in 1921 and 1922. There is now a faster rise in the Walworth than in the Harvard curve. We are beginning to think that this is due to our more effective planning and consequent prompter shipment of our merchandise after receipt of orders. In those earlier days there was hardly a choice but to accept the orders as they were offered and then to arrange to produce the goods as soon as physically possible. Since we are now able to forecast demand, we can manufacture to meet known requirements, and have speeded up to a marked degree the shipment of orders as they are received. This means that our index line, which is based on billings, will probably move ahead of the B line instead of with it. Of course, time is necessary to determine this to be a fact.

So we discovered that the second suggestion of the economists also found application in our practice. We had not only a business cycle of our own, but our cycle had a definite measurable relation to that of general business. And we were, therefore, in position to use in a very tangible way the forecasts which constantly passed through the planning and statistics section. For instance, very definite predictions are given for a full calendar year in advance as to the action that may be expected for this Harvard B line. And their forecasts, in turn, are fairly well substantiated, at least as to general probabilities, by the other forecasting services.

### IV. APPLICATION OF CYCLE THEORY AND DATA TO WALWORTH PLANNING

In the summer of 1921 we had our first opportunity to make use of our discovery. The Harvard B line gave definite assurance that general business was scheduled for an advance. Even when we were not prepared for it, our records showed that we had followed closely the general business trend. What could we accomplish if we prepared for the increase in advance? Industry had just been through a bitter experience that made executives unusually cautious. But we had become firmly convinced by our studies, and such doubt as remained was finally brushed aside by further unquestioned evidence. At about this time the planning and statistics section solicited from the F. W. Dodge Company full information on building contracts awarded. It was thought that the statistical barometers of that activity should prove very enlightening to a business such as ours, because of the nature of our product, which is so largely used in building construction. Again, our business-cycle curve was lined up with the cycle activity shown by the building figures, and there seemed to be in this case not only a direct relation between our curve and the building curve so far as time of cycle changes was concerned, but also there was a very definite suggestion as to the extent of our business variation. Each year that building was ahead a given percentage over the previous year, our business seemed to go ahead by the same amount in the same year; and each year that building fell off by a certain percentage, our business decreased by the same percentage. We did not infer from this that building was the cause of Walworth demand. but rather that the same cause which determined an advance for Walworth determined an advance for building. It was a case of the mathematical proposition that things equal to the same thing are equal to each other, so that the forecasts for building were very serviceable as a forecast for Walworth activity. Thus we had selected one outside barometer to indicate the length of time our curve might continue in its present direction before turning, and a second to suggest the degree of its elevation. an illustration of how valuable such forecasting has been to us, it may be here mentioned that our estimates of sales for 1922 were figured at about 42 per cent increase over 1921. As a matter of fact, building in 1922 advanced over 1921, 43 per cent and our sales were within 0.5 per cent of the forecast amount.

It was mentioned earlier that our business went ahead within a calendar year by the same percentage that general building activity advanced in the same calendar year. It is perhaps well to explain that in our business we must consider calendar years only. Our demand is so seasonal that in estimating the amount of business to be expected during any given set of months we cannot ignore the fact of the influence of seasonality within those months. For instance, the drop of January sales from December sales is 35 per cent, averaged over a series of ten years. This means that in some the drop is as high as 50 per cent, and in an exceptional case 60 per cent. This is our seasonal variation at its worst, to be sure. However, from January there is a gradual rise to March with some falling off in April. May and June resume the stride set by March with again a decline in summer. But September tends to reach the March figure with the October figure normally much higher than March. November and December vary somewhat, but the average is for November to be slightly lower than October, and December the best month of the vear. It is unusual if the business cycle increase or decrease from one year to another is greater than 20 or 25 per cent. Therefore, the seasonal influence is the greater, and to obtain a clear picture of the Walworth cycle we correct the year for seasonal trends and leave the seasonal problem to be taken care of after the cyclical trend has been found.

As a matter of fact, it is not a difficult task to correct the seasonal variation in order to find the cyclical trend. Chart VI illustrates our method of showing both seasonal and cyclical variations, and is the chart we used to compare similar periods in the past with a view to arriving at our estimates for the year 1923. Two points are brought out clearly in this chart: first, that although the seasonal variation of one year is not exactly like that of another year, yet there is a marked similarity; and, second, that in no instance can we find an exact parallel to 1923.

It will be noted that the chart displays a surprising similarity in the last half of the years 1892, 1902 and so on, which were found comparable to 1922, particularly in their seasonal tendencies. In every case a sharp recovery has taken place, the last months being far in excess of the January and February volume. In the same way we find the year following showing a decided

downward trend, in one instance the November and December figures showing quite as low as January and February.

For a number of reasons we were able to draw forward our sales index line with some confidence. The number of months we might expect the line to remain at high levels was very definitely forecast by outside agencies. Again, the amount of increase

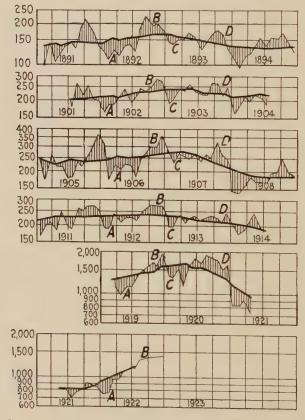


CHART VI.—Comparison of seasonal and cyclic fluctuations.

beyond 1922 was fairly well suggested by reliable figures. Finally, there was a good background for plotting our seasonal areas to the trend line as we had extended it through 1923. This background was supplied by plotting out three "assumptions" and then by process of elimination using the most likely one.

Chart VII shows these three assumptions, any one of which might seem at first to fulfil the conditions. But, after super-

imposing on the cyclical trend the seasonal variations, it was evident that the second curve, called "Assumption B," was much the most logical. Any volume of sales greater than that amount must be secured by greater efficiency in supplying the market through salesmanship, backed up by unusual cooperation of the works, and by complete utilization of the improved market facilities which have been provided for some of our merchandising units.

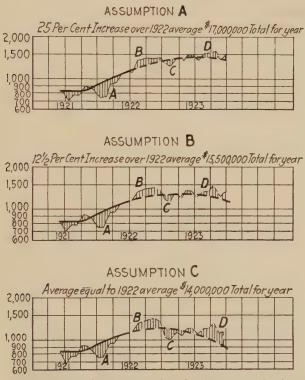


CHART VII.—General trends and seasonal tendencies compared—three assumptions.

It was on the basis of Assumption B, therefore, that we laid out our preliminary production program for 1923. Naturally, the sales estimate had to be broken down into class requirements, and these compared with production facilities before even the preliminary control instructions could be issued. But, having arrived at these class requirements, we had a definite basis for setting up material and labor requirements, and for estimating financial demands.

It is not to be thought that this initial program for the year is adopted once and for all without current revision. So far as the production policy is concerned, there is established each quarter an estimate of actual sales requirements upon the two works as it appears at the time of making such a quarterly estimate. This quarterly estimate goes from the sales department through the planning and statistics section to the vice-president in charge of production, who uses it as a basis for formulating his quarterly production and purchasing programs, and for allocating the production between the two works. Nor is this the final step in the control. Each month before the existing production orders are completed or new ones are received, each works manager sends to the planning and statistics section a statement of his proposed production by each of the classes for the coming month. These reports are coordinated and sent for review to the general office executives primarily interested, particularly to the vice-president in charge of production, for final review. Although at this time some of the work may be in process, it is yet possible to revise the production downward and to curtail purchases to some extent if desirable, or otherwise to revise the actual policies for the current month.

### V. BUDGETARY CONTROL OF SALES, PURCHASES, RECEIPTS AND EXPENDITURES

In addition to control of production, there are naturally many valuable adjustments which can be accomplished by advance information of the type we have discussed. The most valuable is provided by the monthly budget of sales, purchases, payroll and cash which is our business thermostat. This budget serves to control the expenses and finished material purchases of the merchandising units which deal considerably in resale items as well as Walworth materials. Further, this budget serves as the treasurer's advance notice of probable cash requirements several months in advance of the actual requirement date.

On the tenth of the month previous to the one under review, schedules are sent to every unit which makes sales and therefore collects money, or which purchases materials and therefore disburses cash. By the twentieth of that month these schedules are all received back in the office of the planning and statistics section and are combined into a master budget sheet, lettere paper size. This sheet is designed, as shown in Table I, to giv-

BUDGET
1923
ALWORTH
I.—WA
ABLE

Table I.—Walworth 1923 Budget	Intercom- pany pur- chases	(5)	\$ 000.000 000.000 000.000 000.000 000.000 000.000	\$ 00,000,00 00,000,00 0,000,00 0,000,00 0,000,00 0,000,00	\$000,000.00	\$000,000.00		(a) Financial Expense includes \$ 0.000.00 for interest on notes payable 00.000.00 for interest on bonds (book) 000.00 for insurance charge only 00,000.00 for special fund;		(b) Capital Charges includes \$00,000.00 Walworth Realty Co. (c) None of the figures on the budget indicate the effect of any proposed note transaction.
	Intercom- pany billings	(F)	\$000,000.00	\$ 000.00	\$ 0,000.00	\$000,000.00				
	Cash disburse- ments	(E)	\$ 000,000,000	00,000,000	\$ 000,000.00	\$0,000,000.00	\$0,000,000,08			
	Cash receipts	(D)	\$ 00,000,000	\$ 000,000.00 000,000.00 000,000.00 000,000.00 000,000.00 000,000.00	\$ 000,000.00	\$0,000,000.00	\$0,000,000.00			
	Payrolls	(C)	\$ 00,000,000 0,000,000 00,000,000 00,000,000	\$00,000,00 00,000,00 00,000,00 0,000,00 0,000,00 \$	\$ 00,000.00	\$000,000.00	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0			(b) Capital Cha (c) None of th transaction.
TABLE I.—W	Purchases	(B)	00 000 000 00 000 000 00 000 000 00 000 000 00 000 000	\$	\$ 000,000.00	\$0,000,000.00 000,000.00	\$0,000,000.00 (a)00,000.00	\$0,000,000.00 (b)00,000.00	\$0,000,000.00	
	Billing	(A)	\$ 000,000.00	\$000,000,000 000,000,000 000,000,000 000,000,000 \$000,000	\$ 000,000.00	\$0,000,000.00	\$0,000,000.00	\$0,000,000.00	\$0,000,000.00	
			General Office Expense.     Eastern Division     Boston Works.     Western Division     Kewanee Works.	6. Boston Branch 7. New York 8. Chicago 9. Seattle 10. Philadelphia 11. Portland	12. Total Branches. 13. Wal. Int. Co.	14. Total	17. Total	19. Total. 20. Capital and Other Charges	21. Total	

a summary picture of the activities of the whole company. First billings, by units, are set over against purchase invoices to be received and accrued payroll, by the same units. Then there are set against each other cash receipts and cash disbursements, both by similar units. The first set of columns on the accrued basis suggests readily the relation between commitments and sales income. Because of our usual terms of credit, these two columns very definitely suggest the probable cash conditions 60 days hence; and the company's total of commitments, when compared with sales, suggests the current month's profit. The two next columns, or the "cash" columns, suggest probable cash position during the following 30 days. From the treasurer's viewpoint, these cash columns will indicate the degree to which he may liquidate current borrowings from the banks, or the amount which he must provide to guarantee financing the inventory increase. Of course all this activity could not go on without intercompany exchange of goods, particularly from the works to the branches, so two more columns show, by units, intercompany sales and intercompany purchases.

From this "set-up" there can then be observed for each unit upon a single line across the sheet a summary of its condition as an individual entity. Sales to customers plus intercompany sales represent income. Purchases from outside vendors plus payroll plus intercompany purchases represent total commitments made for securing the sales of the month. Or, if there is any change in inventory, after a rough allowance for usual profit on sales, it is readily determined just how much each unit may be changing its inventory condition. Analysis in this form is carried out in Table II.

Such a summary for budgetary forecasting and control would not, of course, be possible had not the earlier groundwork been prepared. The reason it is a simple matter to obtain from each unit head an estimate of his own budget is because he knows very definitely just what his jurisdiction covers, and can obtain from his accounting records, over at least two or three years, the basic data necessary for him to use in estimating the future.

And again we find an opportunity to improve this estimating, because it is possible to prepare, with the expenditure of but a few hours' time every week, a summary of actual figures, which show us, currently, how closely our performance is meeting the estimate. This weekly summary of the actual status of the company

	come	March to date		Visible as of 3-17	H-11		8 00	000 \$	888°	000	\$000	00	\$000	200	\$000
COMPARISON OF COMMITMENTS AGAINST SALES INCOME	date s over in	March		Visible as of 3-27	H-21		000	000	3880	000	8000	3	\$000	000	2000
	Excess of commitments over income (Approximating increase in inventory)	April to date		Visible as of 3-27	H-31		000	8 8	8808	000	000 \$	3	\$ 000	000	90,000
		April		Visible as of 4-17	H-41		000	000	999999		000 \$		\$ 000		90,000
		May to date		Visible as of 4-26	H-51 (C-G)		0000		8888	000 \$			\$ 000		000.00
	profits	Sales income less expected profit			G (D-F)		\$0.000	0000	80000	200	\$0,000		\$0.000	-	
	Sales income excluding profits	ted profit		Dollar profit amounts	(DXE)		000	00 %	20000		 0 %		\$000 l		
		Anticipated profit	Expect-	ed per cent profit margin	Ħ		0.0%	0.0%	0000	0/ 0	0.0%			sales uni	
	Sales	Total sales to	customer	inter- com- pany	D		\$ 0.000	0000	00000		000,0	000 000	000.00	nouted to	
YEAR-TO-DATE		Combined bined purchase and payroll			C (A plus B)		\$ 0.000	0000	0000		000,0	000 008		nor cust	
- 1	Commitments		charge	В		\$ 000	9000	8888	000	800	\$0.000		TAPCHISC		
Max, 1923,	Com	Purchases including I-C and	cluding capital and other charges)	Ą		\$0,000	0000	0000	&O 000	000	\$0.000	" (Only, C. O			
TABLE II.—MAY,	All units (G. O. regular distributed to sales units)						1. Eastern Division. 2. Western Division.		6. Seattle 7. Philadelphia 8. Portland	9. Total Branch.	10. Walworth Int. Co.	11. Grand total	<sup>2</sup> 12. Capital charges and other (Only, G. O. Erronne, S. C. S. C.	13.	

1 The number following any column, identified by "H," suggests that the figures therein have been copied over from the "H" column of the first, accord or later issue of this tabulation.

2 Capital and Other Charges include the following:

Annuary \$ 00 Munsing

On Walworth Realty

On Philadelphia Realty

On Walworth Realty

\$00

March \$00 Preferred Dividend 00 Common Dividend 00 Walworth Realty \$00

00 00 Walworth Realty None

> April May

\$000 Total Capital Charges Listed.

is also prepared on a letter-size sheet of paper. It is set up in exactly the same arrangement as the master estimate for the month, so that direct comparison item by item and unit by unit can be made. It is readily discernible on the fifteenth of the month from the weekly master budget report coming out at that time, whether or not, for instance, our Chicago branch is likely to spend more in the month than they first anticipated. The branch in such a case is supposed to have previously notified us that the estimate was in error. But the weekly reports would develop the situation automatically.

Immediately after the end of the month, approximately 15 days before the final detailed auditor's statements can be made available, the planning and statistics section, from the current accounting sheets as they pass over the desk, abstracts figures for preliminary reports issued to the officers in charge of activities. These reports cover monthly tonnage of orders received, shipments and production, actual purchase commitments, payroll, cash receipts and cash disbursements. There are issued a few other preliminary, yet essentially accurate, actual reports on activities necessary for current control. When the auditor has made out his detailed reports according to the accounting classification, the planning and statistics section issues comparison letters for the various estimators. This is done so that the estimators may have the lump-sum actual totals for the month, in the same form in which they estimate by items for future estimates; and also in order that they may know how far their actual figures vary from the estimate. When some exceptional condition causes the variation between the actual and the estimate, this is explained by the planning and statistics section, but ordinarily the estimator is expected to find the reason for himself and to send in his own explanation.

Perhaps the thing which is most significant in our budgetary system is the simplicity with which it has been possible to operate it. The present work is carried on by three clerks in the general office. The budget is of such a nature that it groups itself into two rush periods during the month, and this makes it possible for the same group of clerks to do the necessary research study when the actual budget work is not pressing. It has not yet been necessary to search for figures that were not readily available from the accounting system as it had been developed with a view to budgetary control. With the records accruing

from the initial accounting, it has required but little rearrangement and interpretation of the facts at hand to present them in form for application to budgetary needs. Yet this is one of the greatest benefits to be derived from the budgetary procedure.

It is quite generally conceded by those who first had objections to estimating for the master budget that they would not now consider giving it up. One of these executives, who had thought that time given to budget estimating would be wasted, has since said that he now realizes that he never before had a real grip on his job. The requirements upon him to estimate the future have forced him to analyze the present. There can be no question that every executive of our company has a knowledge of his duties that he never had before.

#### VI. CONCLUSION

Were I unfamiliar with a control system of this type and reading a crude outline of this kind, I am conscious that I should be saying to myself, "All this is very well, but what does it accomplish? This may be a good recipe, but 'the proof of the pudding is in the eating.' What has the budget really accomplished for the Walworth Manufacturing Company?"

Here are the results for the year 1922: Our actual sales came within 0.5 per cent of our estimate. Cumulatively the first six months were 8 per cent in excess of the estimate; the first nine months were 4.3 per cent, but the full year's figures were so close to the estimate as to be a coincidence. We do not expect again to equal this particular record. We have reason to believe that the earlier months of the year were thrown out of line because of our increased ability to ship promptly. Having advance information, we were able to decide on a production plan that would give us an even flow of material throughout the year, building up our stocks in the spring and summer months to meet the fall demand. This accomplished not only better service to our customers, but greater economy of production, more even employment for our workmen and a great decrease in labor turnover. It enabled us to anticipate our material requirements and to take advantage of low price conditions. It gave our treasurer exact information as to financial requirements. It made it possible for me to place before our directors a definite estimate of the amount of money that would be involved in producing in advance the excess stock necessary for fall delivery, and it justified them in adopting the

program because I could assure them that this investment could be liquidated before the end of the year. It enabled us to set up an ideal inventory for the end of the year and to work toward final liquidation to this ideal point. It proved that this inventory control was practicable, because we came within the limit set by my office.

Of all these benefits, probably the greatest has been our ability to operate on an even basis throughout the year. Under the old conditions we would have produced 16 per cent of our total requirements in the first quarter, 22 per cent in the second quarter, 28 per cent in the third quarter and 34 per cent in the fourth quarter. In 1922 it was possible approximately to equalize the quarterly production figures. In these days when seasonal employment is one of the country's greatest problems, when labor turnover is great and when an actual shortage of labor has occurred, continuous employment at fair wages is the stimulus to the good workman that no temporary attraction can equal. Carried over a period of years, it will secure the type of labor that makes for economy and efficiency. This does not mean of course, that we can counteract the cyclical fluctuations. The fact that we are able to take care of this problem within each calendar year is a substantial step in the right direction.

Budgetary control is now one of the fundamental policies of the Walworth Company.





## PART III

# STABILIZING OPERATIONS AND EMPLOYMENT

#### INTRODUCTORY

The significance of scientific management in relation to the problem of stabilizing plant operations and industrial operations as a whole is treated in Part III, together with the bearing which this has on the problem of security of employment.

Richard A. Feiss, President of the Joseph & Feiss Company of Cleveland, Ohio, discusses "Scientific Management during Periods of Depression" as contrasted with the ordinary type of management during such periods. By reason of the more detailed as well as the more comprehensive knowledge which scientific management gives to those whose business is to plan and to direct, it is possible to look ahead and plan for contingencies which arise. As a result of better control and planning, the scientifically managed organization is better able to adapt itself to changing conditions and to maintain its force unimpaired.

H. Feldman, Assistant Professor of Industrial Relations, Amos Tuck School of Administration and Finance at Dartmouth College, and formerly a staff member of the President's Conference on Unemployment, outlines the change which has taken place in the attitude of thoughtful persons toward the problem of unemployment, due in large part to the same forces as those which have developed scientific management. He shows in the chapter on "The New Emphasis in the Problem of Reducing Unemployment" that the present belief is that unemployment is not due to overpopulation, immigration, changes in the gold supply and other disturbing factors, but to maladjustments in the industrial system, which produce seasonal and cyclical fluctuations.

What Mr. Feldman calls the "American attitude" has placed the emphasis on the strengthening of each business within itself, and he refers to the work of various organizations, including the Report on Waste in Industry and the reports of the President's Conference on Unemployment, as striking examples of this attitude, namely, the "engineering approach" to the problem of

continuous employment.

In "Scientific Management and the Reduction of Unemployment," Dr. H. S. Person states that scientific management, while it cannot alone solve the problem of unemployment, can exert a profound influence in that direction, and particularly that it is a condition precedent to any substantial diminution of unemployment. He shows that scientific management in a plant gives freedom in the administrative field, and that only as a result of this freedom can such policies as the amelioration of unemployment be prepared. But scientific management also contributes directly to the reduction of unemployment, because effective efforts of this nature must be made in the individual shop or office where policies are given concrete expression.

Under competitive conditions in markets where the demand fluctuates, the competitive enterprise which succeeds in reducing to a minimum its variations in employment will be the one which works under scientific management. Dr. Person also treats the aspect of unemployment within employment—that of the workers who are on the payroll, but are laid off part of the time, or who, if not formally laid off, do not have wage-producing work coming through to them.

The distinguished engineer and public servant, Herbert Hoover, contributes in the chapter on "Industrial Standardization" a comprehensive statement of the principles of standardization or simplification. He shows that the first step is the determination of qualities and of grades, of purposes and performances. a formulation requiring the services of technical experts; but that, in addition, such formulation requires the added experience of the manufacturer, the producer and the user. Furthermore, specifications and standards must change if there is to be steady progress in the arts and invention, and requirements must be made subject to periodic review. Mr. Hoover also shows the effect which the establishment of standards may have upon the whole of the processes of production. The elimination of waste directly contributes to greater industrial stability, and consequently more stable employment. It should result in the development of greatly improved products, processes and business practices, and lowering of costs and prices.

#### CHAPTER X

# SCIENTIFIC MANAGEMENT DURING PERIODS OF DEPRESSION<sup>1</sup>

### BY RICHARD A. FEISS

The purpose of a plant organization is production. All production organizations are built for capacity production; therefore curtailment of production due to general business depression is not a true test of the worth of any organization methods devised for production. In comparing one type of management with another, however, times of stress furnish a good test for certain purposes.

In comparing scientific management with the ordinary type of management during times of depression, we shall first take into consideration the counts against scientific management. For practical purposes, all counts many be summed up under one head—a large amount of administrative machinery and consequently a large amount of indirect expense that exists under scientific management as compared with ordinary types of management. We must admit that this difference is a real one. Nevertheless, it is to some extent more apparent than real. Scientific management separates and classifies expenditures of all sorts, charging to the direct expense only the purely directlabor charges. Under scientific management with its precise classification of expenses, a great many expenses are classified as indirect which are universally called direct under the ordinary type of management. This, however, only accounts for some of the difference. Admitting this difference, our contention is that it does not constitute a count against scientific management.

The belief that a large percentage of indirect expense constitutes an organization or business evil is a relic of the time when business men thought only in terms of the antiquated accountant and his antiquated methods. This belief involves a fallacy. It is an attempt to compare two things which are not comparable. As a matter of fact, the proportion of indirect to direct expense means by itself nothing. It is true that there is

<sup>&</sup>lt;sup>1</sup>Reprinted by permission from the Bulletin of the Taylor Society, Aug., 1922, vol. 7, No. 4.

a relation, but let us see what that relation is or what it proves, if it proves anything.

Glance for a moment at the following:

EXAMPLE	A	$\vec{\mathrm{B}}$	C	D	E
Indirect expense	20	25	25	25	30
Direct expense	50	50	35	30	20
			_		
Total expense	70	75	60	50	50

Let A represent the relation of indirect, direct and total expense in any organization running under a good type of ordinary management. Now it is true, if the indirect expense increases without any reduction in the direct expense per unit, as in example B, that comparison with previous condition A would call for investigation. This, however, is not the case under Scientific Management after it is once developed, although during the development period such condition might well exist. Under scientific or any form of management where progress is being made, conditions are very likely to change until we find existing such situations as are illustrated in C, D and E.

The primary object of scientific management or any management is to improve operating conditions and to obtain greater efficiency from the production processes. This is done only by the installation of better methods of management or by inventions or improvements or other short cuts in operation. This, as a rule, does not cut down the expense of supervision, clerical work or other indirect activities. In fact, it is generally necessary not only to improve the work of the executive and other employees on the indirect payroll, but even in some instances to add to this force in order to acquire and maintain the efficiency sought from the operatives on the direct payroll. Here we come to the first fact—that the most significant measure of efficiency is a decrease in the direct expense apportioned to the product.

One can readily see that a comparison of present direct expense with anything but previous direct expense does not in itself mean anything. Take, for example, case D, where the indirect expense is maintained at its normal level and the direct expense is very materially cut down by increased efficiency. While there is a substantially lower expense of the entire product as compared with the case in example A, nevertheless, the proportion of indirect to direct has very materially increased, and so it will be in any example where the efficiency of any production organization is materially

enhanced. This can be done only by decreasing the direct expense chargeable to the product and the consequent increase in the percentage of indirect expense. Consequently, if the proportion of direct expense to indirect expense means anything, it can be stated as follows: That an increase in the proportion of indirect expense to direct expense is a proof of better management and greater efficiency, provided the total expense chargeable to the product does not increase.

There exist in most businesses, besides the indirect payroll, other indirect expenses amounting to a large proportion of the general indirect expense. These consist of such items as carrying charges, maintenance, supplies, and so on. These are proportionately smaller and under better control in the case of scientific management than in the case of ordinary management. Because of better control, there exists the possibility of cutting them down, when necessary, more readily and intelligently. Again, by reason of better control and more scientific organization, fewer economies need be made in times of depression, inasmuch as economies generally looked for during such times under ordinary type of management are continuously being made under scientific management, and the benefit therefrom accrues during normal times as well as during times of stress.

In replying to the counts against scientific management we have already touched upon many of the points that could be called counts in favor of scientific management. There are many more of these, of which only a few need be mentioned. When it is necessary to curtail production during times of depression, the analytical methods used under scientific management for the determination of wages automatically permit curtailment of such expense with greater precision and safety than under ordinary management. At the same time, those executives and methods necessary to maintain utmost efficiency and to permit a just and substantial wage return to employees during normal times are continued during times of depression. For the same reason, and because of better organization, the morale of the force is better maintained. Moreover, because of better control of output and costs, together with the ability to give a better and cheaper service, the necessity for the curtailment of time is less likely to occur.

By reason of the more detailed as well as comprehensive knowledge that scientific management gives to those whose business it is to plan and direct, it is possible to look ahead and appraise and plan for the many contingencies that arise not only during times of depression but at all times. It is for this very purpose that much of the administrative machinery is set up. and therefore a substantial portion of the indirect expense is just as necessary in times of depression as in normal times. As a result of this better control and planning ability, a scientifically managed organization is better able to adapt itself to conditions and to make such economies and plans as are advisable for the maintenance of the business. When conditions are such that it becomes impracticable to maintain any part of the indirect organization intact, it can be reduced as under any other type of management, and the effects of the reduction more accurately estimated. Under scientific management this reduction, if found necessary, can be made more intelligently and more fairly to those affected.

A reduction in the indirect force, however, should be considered only as a last resort. Before dispensing with the services of any of the more valuable members of the indirect force one must take into consideration the following:

- 1. The necessity of better planning to overcome the resistance to business.
- 2. The necessity for leadership and more intensive supervision in order to avoid unnecessary losses in operating.
- 3. The ability, when times pick up, of being able to take advantage of the pick-up against keen competition.
- 4. The possibility of a permanent impairment of investment in the loss of trained personnel of the organization.
- 5. The possibility of the loss of that other most valuable asset—morale.

#### CONCLUSION

In conclusion, one need take only the history of the organizations which are run under true scientific management as compared with those run under other types of management, in order to find the answer. During times of industrial depression and stress such as the world has never before seen, the organizations whose management can be called truly scientific have come through, and are prepared as are no other organizations in their respective industries for the better times to come. In fact, it can be pointed out that these organizations have contributed

materially to the mitigation of the stress of the times and to the early restoration of normal business,

The large proportion of administrative or indirect expense to direct expense, as commonly viewed, therefore, is no criterion of either economy in costs or efficiency in organization. At least 80 per cent of the time we have normal or good times. And management must build with the primary object of doing business effectively at such times. Good management, however, must look ahead and should be prepared for all contingencies. It should make plans for financial reserves to be used during times of depression and should conserve its resources in every other way. This should be done primarily by the building up of business on a basis of service. Business run with a view to service must at all times be based on economies in organization and economies in operation in order to render real service. This is the best preventive of the cutting of wages and the laying off of employees which is so universally practiced during times of depression and results in nothing of constructive value; on the contrary, it produces bitterness. The efficiency needed for the maintenance of business as a service is the object of scientific amnagement. Scientific management at all times organizes for the best possible service based on the elimination of both waste in human effort and waste in other forms, and for the proper control of all elements in industry making for the best efficiency and a fair return to all concerned at all times.

#### CHAPTER XI

# THE NEW EMPHASIS IN THE PROBLEM OF REDUCING UNEMPLOYMENT<sup>1</sup>

#### BY H. FELDMAN

A most significant change has taken place in America during the past few years in the analysis of the problem of unemployment, although the steps actually taken to reduce it have been exceedingly few. If we compare the views of economists and official commissions of inquiry of hardly more than a decade ago with those of today, the contrast is indeed striking. Thus, in the Report of the Wainright Commission,2 which made a thorough study of the subject only 13 years ago, there was not even a hint in the sections on Remedies, Recommendations and Conclusions (pages 65-68) that an important cause of unemployment might be in the slipshod, careless and planless management prevalent in various firms; and no suggestion was made that some employers, at least, could cut down the irregularity of their businesses by improvements in the technique of business administration. The chief recommendations of this Commission, like those of its predecessors in many lands, were: first, the establishment of a system of public employment exchanges (a pseudoremedy on which some people are pinning too strong and naïve a faith); second, the directing of children into promising employment (which is important enough for other reasons, but which will have little effect in solving the unemployment problem); and, third, the long-time planning of public works by the state and city governments (a very desirable policy, but particularly intricate under American political government). The restricted point of view of the time may be seen, for example, in the testimony of Lindon Bates, Jr., a construction engineer and a student of the unemployment problem, who was one of the principal witnesses called at the Commission's hearing. In response to the request for his constructive suggestions, he said:

<sup>&</sup>lt;sup>1</sup>Reprinted by permission from the Bulletin of the Taylor Society, Oct., 1922, vol. 7, No. 5.

<sup>&</sup>lt;sup>2</sup> Commission on Employers' Liability and other matters. New York State. Third Report: "Unemployment and Lack of Farm Labor," 1911.

. . . Since these are the only two conceivable alternatives, it might be recommended, first, that the State undertake as a definite policy to hold some big public work of a public utility in reserve as against hard times; and, second, that this Commission frame as good a bill as is physically possible, for labor exchanges . . . <sup>1</sup>

As a background for a discussion of proposals quite different from the "only two conceivable alternatives" which Mr. Bates mentions, a brief review of remedies proposed in recent years will be presented, to show the real advance which the change in emphasis represents.

#### I. THE TRADITIONARY REMEDIES FOR UNEMPLOYMENT

The greatest labors in the study of reducing unemployment were undertaken by the memorable Royal Commission on the Poor Laws and Relief of Distress (Great Britain), which began its work in 1907 and delivered its main report in 1909. Since a major portion of its work dealt with the Relief of the Able-bodied. the Commission was led squarely into an inquiry as to why so many able-bodied persons were always unemployed and what should be done about it. Its investigators called forth the efforts and cooperation of some of England's greatest thinkers, and notable aid was rendered by Sidney and Beatrice Webb, the latter having been appointed a member of the Commission. The greatest contribution to the subject, however, was the paper presented in 1907 by William H. Beveridge, then Chairman of the Employment Exchanges Committee of the Central (Unemployed) Body for London, and it is this paper, later expanded into a book with the title "Unemployment-A Problem of Industry," whose analysis was called by the Webbs "perhaps the most momentous (discovery) of this generation in the realm of economic science."2 Certainly it forms the starting point of the modern program of alleviation, and its influence has been extraordinary.

This great discovery cannot be described adequately in a brief review, and, indeed, one does not wish to deprive a reader of the pleasure of perusing the whole document; yet some mention of its content is necessary. Beveridge begins by dispelling some of the old notions. Unemployment is not due to overpopulation,

<sup>&</sup>lt;sup>1</sup> Ibid, p. 172.

<sup>&</sup>lt;sup>2</sup> Webs, Sidney and Beatrice, "The Prevention of Destitution," p. 130, London, 1911.

immigration, changes in the gold supply and other disturbing factors, but to cyclical fluctuation, seasonal irregularity and other maladjustments of the industrial system. The reason why the unemployed are without jobs is not merely because they are superannuated, lazy, mentally or physically deficient or lacking in special training. "The inquiry must be one into unemployment rather than into the unemployed." Unemployment is a concomitant of the disorganization rampant in the industrial system. Taking his main cue from the obvious evils of casual employment, he shows that at the waterfront, for example, the number of men required by individual docks varies from day to day. Some docks are busy at precisely the same time that others are slack. Never are they all busy at one time. However, because of the lack of organization of the labor market, the individual docks do not draw upon a common fund of labor by sending the same man to various points, but each dock employer builds up his own reserve of labor, which a period of slack reduces to a "stagnant pool." The aggregate of these "stagnant pools" is, therefore, far in excess of the maximum requirements of the waterfront as a whole at any one time. While some of the laborers get employment at other docks when they find their accustomed ones slack, this adjustment is marked by friction and is only slightly effective. The one thing needful, therefore, is a greater fluidity of labor so that more of the casual workers will secure regular employment. This is to be accomptished by a system of public employment exchanges along the waterfront, through which the dock owners must be made to requisition their requirements for casual workers. When this system of labor exchanges has made regular work possible for the majority of workers through a plan of giving preference to part of the available supply, the rest of the laborers, squeezed out in this process of "decasualization," will be taken care of through some well-timed public work. On a larger scale, the labor exchange will aid in the "dovetailing" of seasonal requirements of various trades. To some extent it will also function even in cyclical fluctuations, for the fortunes of individual firms vary sufficiently to allow for some alleviation of the distress by securing openings for those displaced.

Brilliant as Beveridge's analysis is, it contains a very serious omission. As a consequence, his remedial program falls far short of his penetrating insight. His point of view towards business

firms is entirely extramural. He wants them to employ all their labor through a central source (to be made compulsory by law in some cases), but he never questions the need of the excessive hiring and firing in which inefficient or heartless management may indulge. He seems to have over-looked the many crimes against common sense perpetrated daily by careless business firms. When one's eye alights with relief on the term "business organization," it is to find that Beveridge is using it in another meaning-"dovetailing," organization of the labor market, etc.—and that it does not refer to self-improvement within a firm. The question as to whether the individual business need forever be conducted in such a planless manner as to result in remorseless hiring and firing is not even suggested, while emphasis is put on the obligation of employers to cooperate with other employers and with state agencies in adjusting the workers so displaced to the opportunities in the labor market.

This partial blindness (for such it must be called) has pervaded most of the literature that followed. Neither the Majority nor the Minority Report of the famous Poor Law Commission gave the matter of plant or business efficiency more than passing reference, and no mention at all is made of this possibility in the separate conclusions and recommendations which the divided Commission published. As astute a reformer as Sidney Webb failed to see anything in this aspect of the problem. The Minutes of Evidence show that Mrs. Bosanquet asked him very pointedly why attention should not be given to the responsibility of employers for regularization of employment. She said: "Is it not possible to take the line that if employers want more labor in June than in January they must be prepared to strengthen their present staff and reorganize their work rather than encourage them by maintaining for them . . . a reservoir from which they can withdraw them when they like?" Sidney Webb replied that it was impossible. After a rather insistent rejoinder by Mrs. Bosanquet, stressing the desirability of working along that line, Mr. Webb backed down by saying he agreed with her, provided it could be done; but in the admirable book, "The Prevention of Destitution," by Sidney and Beatrice Webb, subsequently published, the chapters on unemployment never mention the approach through better business management, while at the same time possibilities infinitely more fanciful and less practical are proposed.

The Webbs, indeed, reduced the problem to simplicity in this book. Finding that the slack seasons of different trades occur at different seasons of the year, they conclude that there is practically no seasonal fluctuation in the demand for labor in the community as a whole. Without giving full consideration to the innumerable and almost insurmountable difficulties in the versatile use of this labor power, they find their remedy in an efficient clearing house for labor, in the form of a universally accepted and thoroughly efficient employment exchange system.

Even B. Seebohm Rowntree, whose study of unemployment in York about this time had evidently not suggested to him the importance of regularization by business firms, makes no mention of the possibility in his later work, "The Way to Industrial Peace," published in 1914, which contains a summary of his views on the prevention of unemployment. And almost to this day the omission of this essential phase of the remedial program has persisted in England. This can be seen, for example, in the document "Labour and the New Social Order," a keen and eloquent report on reconstruction by the Subcommittee of the British Labor Party (published in this country in the Monthly Labor Review and as a special supplement in The New Republic of February 16, 1918). While the Committee does not hesitate to propose any radical change in method or any burden on employers, the remedies advanced do not include an insistence on greater efficiency in private business while demanding it in public affairs. It is said that Sidney Webb had a great deal to do with drawing up the document, and it certainly reflects his point of view.

### II. THE AMERICAN ATTITUDE TOWARD THE PROBLEM

It is American thinking that has put the emphasis on the strengthening of each business within itself. The traditional (if not stubborn) dependence on individual initiative of American statesmen and of business leaders has stood it in good stead for once, and the proposals to spread the inefficiency of individual business over the whole country through schemes for "dove-tailing" labor or compulsory insurance modeled on the British plan have not taken root. The fact that much of the opposition to such measures is selfish and reactionary is only of incidental importance, for liberal thinkers as well have come to realize that the American emphasis on regularization will lead to the most fundamental progress.

This American attitude was reflected, for example, in some of the studies made by the Committee on Women's Work of the Russell Sage foundation as far back as 1911 and 1912. This committee, of which Professor Henry R. Seager was chairman, included, among others, Professor Samuel McCune Lindsay and Miss Mary Van Kleeck, all of whom have been prominent in the movement. For example, the three books by Miss Van Kleeck¹ and the one by Miss Louise C. Odencranz² are not only excellent analyses of various phases of the problem of irregular work in the particular trades studied, but the authors do not hesitate to make it obvious that the situation might have been very different if some of the ingenuity the employers have shown in other directions had been applied to the problem of steadying employment for their workers.

What I have called the American attitude on the problem of unemployment may be said to have assumed a definite form at the first national Conference on Unemployment (in New York City, February 27–28, 1914), when Professor Seager, Chairman of the Conference and then President of the American Association for Labor Legislation, was able to say at the beginning of the second day's session:

I believe that, notwithstanding the fact that so many different aspects of the problem were touched upon in the addresses yesterday . . . as speaker followed speaker I felt that the whole matter stood out more and more clearly, and that what ought to be done in this country . . . became more and more obvious.

The aspect of the question most impressed upon my own thought was the necessity of regularizing employment. It is still true that nine out of ten employers employ and discharge their wage-earners with very little consideration for the welfare of the wage-earner.<sup>3</sup>

Those who were in charge of the arrangements for the conference included Henry S. Dennison, whose business experience was particularly valuable in the formulation of policy. The recommendations of the conference, and particularly the Standard Recommendations for the Prevention and Relief of

<sup>1 &</sup>quot;Women in the Bookbinding Trade," 1913 (with an introduction by Henry R. Seager); "Artificial Flower Makers," 1913; "A Seasonal Industry: A Study of the Millinery Trade in New York," 1917.

<sup>&</sup>lt;sup>2</sup> "Italian Women in Industry," Published in 1919, but based largely on earlier data.

<sup>&</sup>lt;sup>3</sup> Am. Labor Legis. Rev., p. 311, May, 1914.

Unemployment, which have been issued from time to time by the American Association for Labor Legislation through its secretary, Dr. John B. Andrews, have given conspicuous place to what is clearly the American contribution to the subject of unemployment, viz., its elimination in large part through sound management technique. This has been reflected in subsequent researches. The Mayor's Committee on Unemployment in New York City, in its report of January, 1916, gave considerable space to this aspect of the problem. It was the principal phase considered in the investigation initiated about the same time by the Philadelphia Department of Public Works (when Morris L. Cooke was its director), which resulted in an excellent concrete study of experience by Dr. Joseph H. Willits, of the Wharton School, University of Pennsylvania. Another example of the practical turn of mind is the report of the Ontario Commission on Unemployment (1916), which said (page 12):

Employers may largely regularize their staffs of workers (1) by improved method of employment and training, which will lessen the present "turnover" of employees; (2) by adding new lines of products to ensure greater continuity of employment; (3) by standardizing a portion of products, thereby making it feasible to manufacture for stock more largely in slack seasons; (4) by securing orders from customers longer in advance than is now the practice, so that the factory output may be made more uniform, and (5) by developing export trade . . .

Since that time the analysis of business methods that impede regularization has grown more refined. The most important investigation by far in this field has been that of the Committee on Waste of the Federated American Engineering Societies—a report made by engineers and business men, not by poor-relief officers. The Unemployment Conference held in Washington in 1921 by call of the President showed the same tendency. The personnel of the members and their approach to the problem of unemployment had an unmistakable management basis.

This is true even in the proposals for insurance. Compulsory contributory unemployment insurance has made no headway here. But in 1916 the Report of the Mayor's Committee of New York City emphasized the importance of having any insurance scheme operate as public pressure on employers to regularize. Such has been the basis of the first agreement providing for an insurance fund, arranged by associations of

employees and employers in the Ladies Garment Industry in Cleveland, which, as is well known, levies the whole cost on the employers, and thus gives them a chance to save it all by efficient management, as some indeed have done. Such is also the basis of American proposals for legislative action, in the remarkably effective provisions of the Huber bill in Wisconsin sponsored by Professor Commons. And furthermore, American firms have begun to draw up their own insurance plans on the same principle of putting the burden on the employer—that is, on management. The Dennison Manufacturing Company's insurance fund, and the funds under the supervison of the Deering-Milliken Company are examples of the trend in placing responsibility for unemployment in America where it belongs.

Firms whose heads are members of the Taylor Society have been particularly prominent in their progress toward regularization. At the Joseph & Feiss Company, for instance, Miss Mary Gilson, who has been the superintendent of employment and service for about ten years, told the author that she did not recollect a single instance of permanent layoff for lack of work. This, in a factory of the hectic clothing industry, is a most remarkable achievement! The Dennison Manufacturing Company has reduced layoffs to a minimum.<sup>3</sup> The Hickey-Freeman Company has gone on for many years, through thick and thin, without laving off any employees permanently for lack of work. These and other firms have therefore done more than the remedial programs of various commissions could ever have hoped to accomplish, and the superiority of strengthening the management policy and curing the evil of unem ployment from within stands forth the more clearly.

Let us for a moment review a few of the main proposals upon which thinkers have put emphasis in the past and which are still featured, so that we may later contrast their efficiency with those proposals which are more modern by relating the experience of one firm which I have selected from among those whose technique I have had the privilege of studying.

<sup>&</sup>lt;sup>1</sup> "Experience under the Employment Guaranty in the Cleveland Garment Industry," U. S. Monthly Labor Rev., p. 135–8, Aug., 1922.

<sup>&</sup>lt;sup>2</sup> The Survey, Oct. 1, 1921.

<sup>&</sup>lt;sup>3</sup> For an analysis of the technique of the Dennison Manufacturing Company, see series of articles on "Outstanding Features of Dennison Management," by H. Feldman, in *Industrial Management*, Aug., Sept. and Oct., 1922.

A. A Public Employment Exchange System. -This proposal has been advocated by every student of the problem. When combined with compulsion upon the employer, as in the case of the dock employers, the remedy would undoubtedly achieve the purpose of considerable decasualization of casual labor. However, it leaves untouched the problem of individual management. An excellent piece of advice was offered, however, by Dr. H. S. Person in an address which he delivered before the American Association of Public Employment Offices, Ottawa, September 20, 1920:

If I were to leave you with one thought, it would be this: Attempt to work yourselves out of a job. You will never be able to do it, for there is bound to be more or less unemployment, and your service is a splendid effort to relieve unemployment. Just now, confronted with the gigantic disorganization resulting from war, your problem is a gigantic one. But look ahead to the more sertled conditions of peace; and resolve from this moment on to conduct a campaign of education for better management in every plant with which you have contact, so that unemployment may be reduced to a minimum.

B. "Dovetailing" and the Mobility of Labor.—This idea has had a glamor which its practical importance does not at all support. With respect to any systematic dovetailing between industries, the author has not been able to uncover a single authentic and successful instance. A psychoanalyst might discover back of the advocacy of the mobility of labor a heritage of the nomad past that impels intellectuals, keen for travel, to see a peculiar facination in free-moving laborers. Thus, in "Seasonal Trades," edited by Sidney Webb, Mrs. Barbara Drake has a paper on "The Waiter," which pictures the route of the migratory waiter who follows the fashionable seasons and transfers his studied elegance thus:

The Riviera, Italy, Egypt, Switzerland, and the South Coast in the winter; the fashionable seasons of London, Paris, and other great cities in the spring; in the summer the British and foreign seaside seasons; Switzerland again; the "Spas" and Scotland in the autumn (page 96).

In the introduction to the same book Miss Juliet Poyntz says:

Even an economic product like a wheat crop, which seems so completely under the domination of seasonal influences, is, considering the production of the world as a whole, not seasonal at all. There is no month of the year in which a wheat crop is not produced in some country of the world (pages 55–56).

a suggestion which conjures up the vision of a vast horde of wandering men, like Arabs over the plains, moving from continent to continent and, like Vikings, embarking for distant climes.

Mobility has a limited application. Its difficulties, from the standpoint of efficiency, are very many, and the experience with mobile (or shall we say fluid?) labor during the war period has not endeared this form of operation to industrial executives, no matter how much the interest in the welfare of the wage-earning class. In fact, many will say that if we need anything today it is to reduce the mobility (i.e., turnover) of labor, and to make each community self-centered with respect to its labor supply. And Professor Don D. Lescohier, formerly Superintendent of the Minnesota Public Employment Office, in his book, "The Labor Market," quite pointedly says (page 304):

One of the essential labor problems that confront the United States is the checking and the reduction of the migrating of labor. Local self-sufficiency in labor supply is a goal to be striven for by every community... The Minnesota office... was able to entirely eliminate two-thirds of the state from the Minneapolis market.

To the practical business administrator the difficulties of labor mobility as a problem of management are obvious enough; if transfer within a firm is attended with many complexities, the organization of the whole market so that efficient dovetailing will result from mobile labor presents insuperable difficulties. And from the social point of view all our panegyrics on the influence of home life will have to be discarded if we take any serious stock in the proposal to have wandering hordes of men touring the country to eke out their living. In an article on the I. W. W. in the Atlantic Monthly of November, 1917 (pages 651–662), Carleton Parker said:

Numerous statistical studies show that the average term of employment of the migratory worker is between ten and fourteen days. With a stake of \$10 he will retire to a hobo camp beside some stream—his "jungle" as the road vernacular has it—and, adding his daily quarter or half dollar to the "Mulligan fund," he will live on it until the stake is gone. If he inclines to live further on the charity of the newcomers, he is styled a "jungle buzzard" and cast forth. He then resumes his haphazard search for a job, the only economic plan in his mind being a faint realization that about August he must begin to accumulate his \$30 winter stake. Each year finds him physically in worse disrepair,

psychologically more hopeless, morally more bitter and anti-social. His importance to any forecast of our nation's future lies in the uncomfortable fact that proportionally he is increasing in number and his recruiting group above is increasing in unrest and economic instability:

- . . . The casual migratory laborers are the finished product of an economic environment which seems cruelly efficient in turning out human beings modeled after all the standards which society abhors. (Italics mine.)
- C. The Long-range Planning of Public Work.—This is certainly a desirable idea, but social reformers will have to "take a lot of punishment" for every step they actually make in this direc-The proposal was quite proper in England, France or Germany, accustomed to unified systems of public administration and to national control over local government. In a country such as England, where the whole tendency in recent decades has been to subordinate completely the House of Lords, the House of Commons and even the Cabinet to a single officer, the Prime Minister, who is entrusted with both executive and legislative leadership, it is much more natural for long-range policies to be suggested. B. Seebohm Rowntree and Bruno Lasker, in their book on "Unemployment, A Social Study," published in 1911, describe a scheme of afforestation which would occupy the unemployed of York a few months a year for 80 years, and even have the temerity to estimate (page 76) that: "At the end of 80 years, when the whole forest reaches maturity, 42 men would be permanently employed, and 382 for four months each winter." In America, however, harsh critics have maintained that we have been unable to secure a consistent policy even for the eight years of a double term! Therefore, until we improve our national system of administration, as well as that of our states and cities. we can expect little long-range planning. The effort to secure long-range planning is indeed worth while, but the results from it will be very meager for decades to come. For efficiency in our system of government (if I may paraphase the prophesy that Samuel Gompers made in another connection to Mr. Untermeyer) will not come next January 1 at four o'clock if it doesn't rain.
- D. The Training of the Unemployed.—The Minority Report of the Royal Poor Law Commission was quite shocked at the system of blind-alley employment for young people, and called its discovery "perhaps the gravest of all the grave facts which this Commission has laid bare." But the great interest in this

<sup>&</sup>lt;sup>1</sup> Royal Commission on the Relief of Distress (Great Britain), vol. 37, p. 1167, 1909.

phase of employment is really due to the fact that so many investigators of unemployment have dealt with the relief of the unemployed, and of those who resort to charity; the proportion of unskilled and unreliable persons among those applying for charity is far greater than the proportion of unskilled and unreliable in the community as a whole. Sidney Webb and Beveridge as well as others make it clear that lack of training is only the incidental reason why particular individuals are unemployed, and Webb goes on to say that if employers could not distinguish between employees on the ground of skill they would perhaps find a distinction in the color of their hair. The President's Conference on Unemployment paid no attention to this phase of the problem, and, since it has but slight reference to the major issues, their attitude was undoubtedly correct. this connection it may be remarked that some of the most efficient firms in the country, notably, for instance, The Joseph & Feiss Company, really prefer untrained employees, because the methods of work taught by the company are so different from those of other firms. As elsewhere explained, however, there is a certain kind of training which undoubtedly will help to reduce unemployment, but the current literature has not reflected it.

E. Insurance.—I have already treated this factor, and it is clear that American thinking on this subject is far in advance of the English plan of compulsory and contributory insurance, which penalizes the well-managed and the poorly managed firm alike, or the Ghent plan of subsidizing trade union funds, proposed by the Webbs, since that takes the whole responsibility away from management.

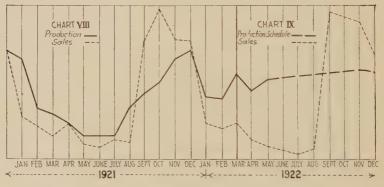
Let us now consider the application of what Richard A. Feiss has called "the engineering approach to the problem of continuous employment" in a concrete instance. From the various firms which have tried to regularize their production and employment through improved management, I have selected a simple case which presents a striking instance of the efficacy of the new method.

# III. THE HILLS BROTHERS COMPANY—"DROMEDARY" DATES

Chart VIII presents a graphic account of two important factors of the business of the Hills Brothers Company, largest

packers and distributors of dates in the country. The dotted line shows the sales, and in 1921, as well as in other years, there was a pronounced seasonal peak in the three autumn months. The year 1921 was not a year of depression for this company; in fact, the demand for dates was greater than the supply. Yet the curve of production (packing—the solid line) shows an extreme fluctuation, with a sharp peak preceded by a deep, wide hollow. In terms of employment it meant many men and women laid off, many persons left without income temporarily and a very much impaired morale in the plant.

Now what would have been the solution for this situation in the light of the traditionary program of remedies? (1) The



CHARTS VIII AND IX.

employees would more readily go to the Brooklyn office of the public employment exchange and endeavor to find work—perhaps in a needle factory in New York, or possibly a tire factory in Akron. (2) Some form of insurance would support, on a meager basis, those who could not get located. (3) Some form of public work which Brooklyn presumably had long planned for a year of depression would suffer the competition of a group of workers whose trade was not cyclically depressed at all but which was merely having its regular seasonal slack. (4) Some of the girls might have been offered training for the needle trades or some other occupation which perhaps is itself irregular. And in the meanwhile public effort would have provided no stimulus to the Hills Brothers Company to heal itself.

Fortunately, within this firm there is stimulus enough in its ideal of sound business progress and the maximum comfort for its workers. Its president, L. R. Eastman, and other officers have not been unmindful of the possibilities of regularization. To their surprise, this proved not nearly so hard as they at first thought it might be. They had recognized the seriousness of the problem and for nearly ten years it had been considered from various angles. A good deal of effort had been exerted in the direction of stimulating a more even demand. Selling and advertising had been adjusted to this purpose. Other expedients. including the analysis of various production methods had been studied. None of these efforts had proved completely effective and it was not until 1921 that the real solution was discovered—a solution which had often suggested itself but which it took time and experimentation to develop. Ernest G. Draper, comptroller of the company, recently wrote to the author:

The discovery of our refrigeration process was quite simple. When we asked ourselves the question how best to regularize our package date business, the first answer that came to our mind was the one which we ultimately adopted. Practically all that we had to do was to determine by chemical test the temperature in which dates kept the best and longest. Having found the answer to that question, the rest of the problem was merely so to arrange our working schedules as to conform to the newer and steadier methods of packing after, of course, we had erected the cold storage plant . . . The results in ease and better quality of manufacture are already apparent . . . A feasible and comparatively simple answer to the problem was found when we determined to give the matter some thought. It had never occurred to us to do so in the past and the chances are that if we had not done so we would today be working along the old wasteful and inefficient lines.

The progress achieved can be seen in Chart IX. As a result of a policy inaugurated in March, 1922, instead of manufacturing for the peak at one time, the company now manufacture practically an even amount regularly, basing the production schedule on the anticipated sales of the whole year. The production curve will therefore either be steady or rising gradually, and the peaks and hollows in employment will be practically eliminated.

I do not pretend that the problem is equally simple in all industries. In the Dennison Manufacturing Company, for example, the synthesis of regularization was achieved only after years of detailed experiment and endeavor.<sup>1</sup> The need of versatile management will lead us most directly to fundamental progress in regularizing industry. When efficient management has done all that should be expected of it, the disease of unemployment will be so moderated that a complete cure through the aid of the other and less important remedies discussed should not be difficult.

<sup>&</sup>lt;sup>1</sup> See footnote 3, page 175.

#### CHAPTER XII

# SCIENTIFIC MANAGEMENT AND THE REDUCTION OF UNEMPLOYMENT<sup>1</sup>

BY H. S. PERSON

Scientific management contains two fundamental ideas. The first is that management should analyze every phase or element of the business so far as possible in accordance with the scientific method—the method which by research, investigation, experiment or otherwise secures all available data concerning each phase or element of the business (physical, physiological or psychological) and derives therefrom relatively stable and dependable facts on which to base plans and procedure. Those who are not acquainted with conventional factory and office operations are surprised to find how revolutionary an idea that is, to what extent business is permeated by the habit of tradition, imitation, speculation and taking things as they are or as they come.

The second fundamental idea is that, these dependable facts once ascertained, plans for operation and operating controls shall be developed which are relatively precise in their intentions and expectations of results, because based upon a knowledge of conditions resulting from the preceding scientific analyses. This makes possible such a coordinating of the energies embodied in brains, muscles, equipment and materials as to secure the maximum product with the minimum effort, and with minimum waste of any one of these forms of energy; and it makes possible also a better coordination of production with analyzed demand, and on that account a diminution of that social waste which results from mistaken production.

In support of the first fundamental idea have been developed such mechanisms, among others, as job analysis, time study, fatigue study and statistical analyses of all sorts; in support of the second fundamental idea, such mechanisms, among others, as routing, order of work, instruction cards, inspection, functional foremanship, precise specifications for materials and progress records. However, it is the fundamental ideas rather than the

<sup>&</sup>lt;sup>1</sup>Reprinted by permission from the *Bulletin of the Taylor Society*, Feb., 1921, vol. 6, No. 1.

mechanisms which all of us should, and so few of us do, keep in mind.

To what extent is this scientific procuring and analysis of data and the development of precise operating plans and controls possible in the conduct of an enterprise? This question leads to a distinction between administration and management and to a further definition of management.

The Difference between Administration and Management.— If you will have in mind the conventional organization of a business you will recall that it presents logically three fields of activity: a field represented by the stockholders, directors and president, in which is determined the purpose and the larger, far-reaching governing policies of the enterprise; another field presented by the manager, superintendent, assistant superintendent and their assistants, in which is determined the immediate operating policies and methods, and in which resides the immediate control of operations; and a third field, in which are found the foremen and workers—those who actually conduct the necessary operations. The general manager may be considered the individual who ties the first two fields together, and the foremen as the individuals who tie the second and third fields together. Field one let us designate by the term "administration" and field two by the term "management."

Now it is probably perfectly obvious that, while statistical and similar methods of investigation and research may be utilized in solving the problems pertaining to the administrative field, it would nevertheless be incorrect to say that industry has developed any such thing as scientific administration. Each year more decisions are being made on the basis of facts determined by a greater utilization of the scientific method, but nevertheless a large proportion of the decisions in this field are made as the result of intuition or sound judgment or a wisdom which grows out of long experience.

On the other hand, in the field designated by this narrower application of the word "management," it is possible to utilize to a high degree the scientific method of determining facts, and to establish plans of operation and controls for operation which have an astonishing precision in forecasting and securing results and in securing these results with a minimum waste of time and of the elements which enter into production, and with a minimum of that waste which results from the absence of coordination

between production and consumers' demand. It is really in this narrower sense of the word "management" that the term "scientific management" should be used.

The Reduction of Unemployment.—I think I shall be expressing correctly the judgment of the more thoughtful management engineers when I state that while scientific management alone cannot solve the problem of unemployment, it can exert a profound influence in that direction, and, particularly, it is a condition precedent to an substantial diminution of unemployment.

Scientific management alone cannot solve the problem for the reason that unemployment is so largely a problem of administration. If you consider the nature of our social organization for industrial purposes, the motives which inspire industrial enterprise and the mental habits which enterprisers have developed in the industrial régime which characterizes our civilization, you will perceive that there is inevitable a certain amount of unemployment and the danger of a very considerable amount. are organized to conduct industrial enterprises as more or less speculative undertakings; possessors of administrative and managerial ability speculate in combining with that ability hired capital and labor, or possessors of capital speculate in combining with their capital hired administrative and managerial ability and labor. And just as they buy material things when they think they need them, and refrain from buying when they see no profit in the turnover, they also hire or discharge workers according to their judgments of the state of the market. We must not forget that, while production is the creation of utilities for the satisfaction of human wants, and sounds like a very simple undertaking, it is in practice by no means simple. The total of human wants is uncertain and must be estimated; the part any individual enterprise may take in their satisfaction is more uncertain and must be estimated; and the kinds and qualities of the elements which must be combined by an enterprise for creating the utilities which will satisfy the wants are uncertain. It is more or less of a speculation, and both materials and human energy suffer the risk of being or not being marketable to those who do the speculating. The dominating motive in industry is the making of profits, and the attitude of mind towards employment and unemployment is determined chiefly by that motive.

It is a fact that for various reasons—modification of the profits motive by the service motive, an increasing spirit of humani-

tarianism and perhaps particularly the pressure of the workers in collective action—the problem of unemployment is being considered more and more seriously by administration. But I think we have lost our perspective if we fail to realize that the profits motive is still dominant, and enterprise—manufacturing as well as merchandising—is chiefly a speculating activity.

Perhaps if administrators had more time to give to administrative problems—the problems of the long look ahead and the wide look around, problems pertaining to the economic and the trade environment of the business itself—there might be more concerted action looking towards the reduction of unemployment. But most administrators feel that they do not have the time. They are too much absorbed in immediate problems of the plant and late afternoon worries. That suggests one of the reasons why management engineers believe that scientific management is a condition precedent to any thoroughgoing attack on the unemployment problem in the plane of administration.

If our enterprises were better organized and better managed, so that the managerial and operating departments were functioning more or less automatically in accordance with well-established administrative purposes and principles, administrative executives would then be able to do their work in accordance with the exception principle—a principle which leaves to the managerial force the responsibility for working plans and details, and to the administration force the responsibility for the exceptional detail and the governing policies.

On the basis of such organization and management only is the administrative executive free to give proper attention to long-run policies and major problems—to such problems as unemployment in its administrative aspects. Such a basis of organization and management is assured only where there is superior management. It is scientific management in the plant which gives freedom in the administrative field.

This indirect help of scientific management in freeing administrators to attack the problem of unemployment is not the only help it offers. Scientific management itself contributes directly to the reduction of unemployment.

No matter what policies those ultimately responsible for the conduct of enterprises may adopt, no matter what assistance the state may render, the effective effort to reduce unemployment will be made in the individual shop or office, where policies are

given concrete expression. Directors may declare that their ideal is continuity of employment, but the extent to which the ideal is realized depends upon the effectiveness with which managerial executives, the planning room and the operating staff do their work.

Seasonal and Cyclical Unemployment.-Most enterprises operate under competitive conditions in markets in which the demand fluctuates. Business has not learned how to free itself from those alternating conditions known as buyers' and sellers' markets; nor have many enterprises learned how to free themselves from the seasonal demands which characterize the disposition of their output. Under such circumstances the taking on of workers in one year and the discharge of workers in another year, or the taking on of workers in one season and their discharge in another, is to some degree inevitable; and only the most scientific of managements is able to reduce these variations in employment to a minimum. The competitive enterprise which succeeds in reducing these variations to a minimum is the enterprise which works out a balanced production of the various products according to seasonal demand: which establishes a schedule which coordinates the financing, producing and selling of these products; which has such organization and methods of planning and operating control in its several departments as to maintain the schedule of coordinated financing, production and selling; which, as a result of exhaustive investigation and analysis, has such command of the elements entering into its operations as to make possible the coordinations, schedules and controls I am enumerating; and, not least, which has such a policy of human relations and such a special handling of the personnel problem as to reduce to a minimum the variations in that particular element known as labor.

In the degree to which an enterprise has such management may it hope to achieve continuity of employment. That kind of management is scientific management.

Unemployment within Employment.—There is another aspect of unemployment to which adequate attention is not given. That is unemployment within employment. We usually consider the unemployment problem as concerned with the workers who are without jobs—not on payrolls. There is the equally serious problem—perhaps more serious because more insidious, for it exists frequently when we believe we have no problem of

unemployment—that of the workers who are on payroll, but are laid off part of the time, or who, if not formally laid off, do not have wage-producing work coming through to them. There is more of that than most people suspect, and the situation is deadly in its effects. The only approach to a solution of that problem is through the management which knows just how many workers it can provide with work, and has such control of its processes as to insure a steady flow of work—scientific management.

We hear a great deal these days about unemployment insurance—the setting aside of part of the profit of good years to insure an income to workers during bad years. Some such institution is bound to come, for it is based upon the incontrovertible theory that an industry must carry all who are in the long run essential to its existence—workers as well as owners of capital—upon the theory that a worker invests his life in an industry just as a capitalist invests his savings. Assuming that the problem of unemployment—for irregularity of income for the workers is an aspect of the problem—is to be attacked in that way, how is any particular enterprise, or any particular industry to carry the burden of unemployment insurance, if it is inefficiently conducted? The advocate of unemployment insurance is consciously or unconsciously an advocate of scientific management.

#### CHAPTER XIII

## INDUSTRIAL STANDARDIZATION1

#### BY HERBERT HOOVER

Specifications are the formulated, definite and complete statements of what the buyer requires of the seller. They must be an accurate representation of the chemical and physical characteristics of the article or material required—and they must be adapted to the best practice of production and distribution.

The first step in formulation, therefore, is the determination of these chemical or physical characteristics and this brings us to the entire field of standardization of commodities; that is, the determination of qualities, of grades, of purposes and performance. Scientific standards, of course, are not new: Emerson defined a standard as That which is established by investigation or authority to be a reasonably attainable maximum of desirability." The more accurate definition of scientific standards has received a great impulse under the research necessitated by the war and the very large development of industrial and commercial vision since that time. Their formulation requires the services of chemists, physicists, engineers and what not. But beyond this, it requires something that has been too often neglected, and that is the added experience of the manufacturer, the producer and the user. No economy is to be obtained by setting up such a standard, and consequently such a specification, for an article as will require that it be specially manufactured, when an article already largely produced for commercial consumption will give equal service, or by the setting up of such requirements as will necessitate increased costs of production, without compensation in service.

Standardization insures quantity production, and hence lower production cost, smaller investment of capital and, therefore, the release of capital for other industrial purposes and developments.

Specifications and standards are a changing requirement, for there is steady progress in the arts and invention; and requirements, therefore, must be subject to periodic review.

<sup>1</sup>Part of an address before the Conference of State Purchasing Agents held at the Department of Commerce, Washington, D. C., May 26, 1923.

Especially in research work and in the elaboration of methods of testing can the federal government and its laboratories be of value to purchasing agencies and industry generally. Research is a necessary component of standardization and the formulation of specifications.

Research points out the ideal standard of excellence, which the commercial standard adopted should reach as nearly as possible; the "final specification must be a compromise between consumer and producer—the consumer demanding the nearest approach to the ideal; the producer agreeing to approach that ideal as nearly as possible commercially—cost, rapidity and quantity of production, service requirements all being given due consideration."

The determination of methods of testing is of great importance; probably 75 per cent of all controversies regarding rejection and penalties are caused by the lack of standard methods of testing.

The Value of Standardization.—Industry has long struggled to establish standards and to secure their acceptance as a method of simplifying the process of manufacture and raising the ethics of production. Furthermore, where standards and specifications are successfully developed by the government through the methods we have undertaken, they are receiving wide voluntary acceptance and adoption amongst public consumers. I need only point to the case of cement, where practically the whole output of the country is now produced and distributed on the basis of federal standards and tests—it being sufficient in the purchase of cement simply to state "federal specifications." It has been a great boon to the cement industry to establish the uniformity and quality of its products; it has been an even greater boon to the construction industries of the country to share in the benefits of such establishment of quality and such method of test.

I may illustrate one phase of the problem that lies in another direction, in the effect that the establishment of standards and thus of specifications may have upon the whole of the processes of production. We had to consider the specifications for a wearing part in automobiles. The products of different manufacturers were secured and were placed under exhaustive chemical, physical and actual operating study. It was found that under equal conditions this wearing part had, from manufacturer A, for instance, a life of one year, from manufacturer B a life of two years and from manufacturer C a life of three years, and so on—with all sorts of variations in between. In this case, we communicated

the result of the investigation to the manufacturers not as to names but purely as to qualities disclosed and the physical characteristics which were developed as necessary. The result of the conference and study which grew out of this matter was that in the next offering of these parts none of them failed on the long-life test, and the improvements had been put into general production. A computation made by manufacturers shows that the benefit to the public automobile user through the longer life amounts to a saving of at least fifteen million dollars a year—and it is entirely a saving of waste.

This work on commercial standards and specifications has traveled even farther afield, for many industries are now applying to the Department of Commerce to establish standards upon which specifications may be founded. We have a very illuminating case in the matter of gasoline, where the automobile manufacturers' association was anxious to secure a standardization of gasoline on the basis of highest performance, whereas the gasoline producers very naturally wished to include as large a percentage of kerosene in the gasoline as was commercially possible.

At the request of these two industries, an exhaustive physical examination of the subject was carried on by the Department of Commerce, and in the end, as the producer and consumer were not able to agree between themselves as to the standard, they ultimately left it to the Department of Commerce for determination—and I believe the specifications used for federal government purchases are likely now to become the national standard.

There is still another phase of this whole question of great importance to industry and commerce. There has been a steady movement towards the simplification of dimensions in many common articles. It is a branch of standardization. The Department has undertaken organized cooperation with industry in this matter.

Simplification of dimensions or sizes has been successfully carried out through conferences at the Department of Commerce in vitrified paving brick, beds, springs and mattresses, metal lath, asphalt penetrations, hotel chinaware, files and rasps, rough face brick, smooth face brick, common brick, range boilers, woven wire fencing, milk bottles and milk bottle caps, bed blankets, hollow building tile, structural slate, roofing slate, forged tools, lumber, builders' hardware, asbestos paper, asbestos millboard, steel barrels and drums, plumbing supplies, bolts and nuts for

farm machinery and other items. And in every case the consuming trades have been brought into cooperation with the producing trades for this purpose. The savings to the public and industry from these cooperative arrangements can be estimated in scores of millions. Such simplification will not only greatly reduce the cost of manufacture, by permitting larger repetitive operations, but it will also greatly cheapen the cost of distribution, because dealers will not have to carry so many different varieties in stock.

One part, therefore, of this problem of specifications is to see that the specifications fall within the area of simplified dimensions, thus securing the practical enforcement of such simplification by confining the demand of the consumer within this number of varieties.

Simplification is not interference with grade or quality or individuality. It is simply an elimination of waste in production and distribution. I could cite several hundred different articles and materials which have been simplified in the above fashion. And I could cite many practical results that have followed. I have a communication from one of the textile by-product manufacturers, stating that the simplification agreed to at conferences in this Department has saved, during the first year of its operation, upwards of twenty-five million dollars to the industry. And all these successful simplifications ultimately reduce prices to the consumer, for under a competitive system he must sooner or later receive a large part of the benefits.

Now I do not wish to give the impression that specifications must be newly discovered in order to be proper and advantageous. Our engineering and professional societies, especially the American Society for Testing Materials and the American Engineering Standards Committee, have long been engaged in the preparation and standardization of certain types of specifications; our university laboratories, our great industrial laboratories, the engineers in our large industries, have for years been developing specifications in a great multitude of materials. Many of these specifications have lain dormant for lack of use by the consumer in his demands upon the producer. Others have not had applied to them the test of commercial experience in production. It is our purpose to adopt whatever is good, to put it under review as to its practical application and, as we have done hitherto, to call in the expert manufacturer and producer for his cooperation and advice.

The direct purpose of any wise cooperative effort in the adoption of specifications is thus to secure constructive application of scientific knowledge to service requirements; to coordinate similar demands and eliminate unessential differences; to balance increases in cost against probable service improvements, taking full advantage of existing commercial varieties; and to formulate adequate test or inspection methods—all this resulting in the development of greatly improved products, vital support to the national movement toward simplification of lines, processes and business practices, and marked lowering of costs and prices. When such a cooperative undertaking combines federal, state and municipal groups, as in the present instance, we have the additional advantages of the unequaled facilities of government laboratories in investigation; the broadcasting, with government approval, of many little known but excellent specifications developed by private industries; the prestige of government specifications leading to wide voluntary adoption in commerce; and the unification of demand in vast purchases with incalculable benefit in raising and stabilizing the quality of American production.

Elimination of Waste.—I wish to travel somewhat further than the above highly technical discussion into the field of broader economics of production and distribution. If you will examine our economic fabric today, you will find that our farmer, through the disparity between the prices of his products and the prices of the commodities he buys, is in a much more disadvantageous position than he was before the war. Thus, broadly speaking, the buying power of a larger part of our population has not kept pace with the rest of us. When you begin to account for this fact, you will find the explanation in the higher taxes imposed by the war and in the very much greater proportionate increase of industrial wages as compared with the income of the farmer. I believe that I am historically correct when I say that, hitherto in every case of emergence from periods of inflation. labor has been able to hold on to a large part of the gains which it made in wages; and that the solution of the problem of decreasing the costs of manufactured articles to the level of the agricultural population's buying power must come about to a considerable degree through increase in the efficiency of industry and commerce—or, stated in other terms, through the elimination of waste in the processes of industry and commerce.

# NATIONAL BUREAU OF STANDARDS OF THE DE-

FUNC-

Development, Construction, Custody, and Maintenance of Reference and cation in Science, Engineering,

#### STANDARDS

1

#### STANDARDS OF MEASUREMENT.....

Reference and working standards for measurements of all kinds, including fundamental and derived STANDARDS OF MEASUREMENT for expressing the quantitative aspects of space, time, matter, energy, and motion, and of their interrelations.

By definition, specification, or material standard, covering, for example, length, area, and volume; mass, weight, density, and pressure; heat, light, electricity, and radioactivity, including for each the quantity, flux, intensity, density, etc.

2

#### STANDARD CONSTANTS.....

Natural standards or the measured numerical data as to materials and energy, known as physical or STANDARD CONSTANTS, *i.e.*, the fixed points or quantities which underlie scientific research and industrial processes when scientifically organized.

Mechanical equivalent of heat, light, electricity, and gravitation; specific densities; viscosities; melting and boiling points; heat capacity; heats of combustion; velocity of propagation of light; conductivities of materials to heat and light; electrochemical and atomic weights; and many similar magnitudes determined experimentally with maximum precision and referred to fundamental standards of measure.

3

# STANDARDS OF QUALITY.....

Specifications for material (by description, sample, or both), known as STAND-ARDS OF QUALITY, fixing in measurable terms a property or group of properties which determine the quality.

The numerical magnitude of each constituent property pertinent to the quality involved, and specific magnitude in units of measure of such significant factors as uniformity, composition, form, structure, and others.

4

#### STANDARDS OF PERFORMANCE.....

Specification of operative efficiency or action for machines and devices, known as STANDARDS OF PERFORMANCE, specifying the factors involved in terms susceptible of measurement.

Numerical statement of speed, uniformity, output, economy, durability, and other factors which together define the net efficiency of an appliance or machine.

5

# STANDARDS OF PRACTICE.....

Codes and regulations impartially analyzed and formulated after study and experiment into STANDARDS OF PRACTICE for technical regulation of construction, installation, and operation, and based upon standards of measurement, quality, and performance.

Collation of standard data, numerical magnitudes, and ranges of the pertinent. factors defining quality, safety, economy, convenience and efficiency.

# PARTMENT OF COMMERCE, Washington, D. C.

#### TIONS

Working Standards and their Intercomparison, Improvement, and Appli-Industry, and Commerce

#### PURPOSE

To AID ACCURACY IN INDUSTRY through uniform and correct measures;

To ASSIST COMMERCE IN SIZE STANDARDIZATION of containers and products; To PROMOTE JUSTICE IN DAILY TRADE through systematic inspection and

regulation;

To FACILITATE PRECISION IN SCIENCE and TECHNOLOGIC RESEARCH through calibration of units, measures, and instruments involved.

To SERVE as an EXACT BASIS for scientific study, experiment, computation, and design;

To FURNISH an EFFICIENT CONTROL for industrial processes in securing reproducible and uniformly high quality in output;

To SECURE UNIFORMITY OF PRACTICE in graduating measuring instruments, or in compiling tables for standards of quality and performance, and wherever such uniformity is desirable:

To AID LABORATORY RESEARCH BY REDUCING ERRORS and uncertainty caused by use of data of doubtful accuracy.

To SECURE HIGH UTILITY in the PRODUCTS of industry by setting an attainable standard of quality;

To FURNISH a SCIENTIFIC BASIS for FAIR DEALING to avoid disputes or settle differences:

To PROMOTE TRUTHFUL BRANDING and ADVERTISING by suitable standards and methods of test;

To PROMOTE PRECISION and AVOID WASTE in science and industry by affording quality standards by which materials may be made, sold, and tested.

To CLARIFY THE UNDERSTANDING between maker, seller, buyer, and user as to operative efficiency of appliances and machines;

To MAKE EXACT KNOWLEDGE THE BASIS of the buyer's choice;

To STIMULATE AND MEASURE MECHANICAL PROGRESS.

To FURNISH for each utility a single IMPERSONAL STANDARD of practice as a BASIS FOR AGREEMENT of all interests, clearly defined in measurable terms;

To INSURE EFFECTIVE DESIGN and INSTALLATION of utilities of all kinds;

To PROMOTE SAFETY, EFFICIENCY, and CONVENIENCE in the MAINTE-NANCE and OPERATION of such utilities;

To SECURE UNIFORMITY OF PRACTICE where such is practicable, and EFFEC-TIVE ALTERNATES in other cases. There are a great many directions in which this problem of waste elimination and increased efficiency extends. It extends even into such problems as an ample transportation system. But a very large opportunity for the elimination of waste and the increase of efficiency lies in the field that I have been describing. It is a field of much larger dimensions, in hundreds of millions and billions of dollars, than will be believed by any except men of professional experience.

I could formulate these propositions in terms of reducing the cost of living, or I could formulate them in terms of raising standards of living. Whichever economic phrase we may adopt, they both lead to the same end—and that is the increased comfort and happiness of our people.





# PART IV

# OWNERSHIP, MANAGEMENT AND WORKERS

# INTRODUCTORY

The relation of owner, manager, workman and social scientist to industry, together with the problem of industrial democracy in its relation to efficiency, is discussed in Part IV.

One of the early papers bearing on these topics is "The Progressive Relation Between Efficiency and Consent," by the late Robert G. Valentine, former Commissioner of Indian Affairs and a pioneer in liberalizing industrial relations. Certain statements which sounded daring in his lifetime (he died in 1916) are already commonly accepted, but the importance of the contribution which Mr. Valentine made to certain present tendencies in scientific management has seemed to justify the inclusion of this paper.

He states that the days of compulsion—the days of service without consent—are over, and that there must be both individual consent and group consent in industry. He assumes that there is a science and art of democracy, and that this must be combined with the latest developments of efficiency and production. It is interesting to note that he holds that the strength of unionism lies in the fact that unions are effective consumers' organizations with an educational interest. By combining the forces of efficiency and consent, he believes that it is possible to secure a sound basis for the science of management.

Meyer Jacobstein, member of Congress from the 38th New York District, and former labor manager of the Stein-Bloch Company of Rochester, New York, asks "Can Industrial Democracy be Efficient?" and answers by a discussion of the Rochester plan for the clothing industry. Mr. Jacobstein describes the agreement entered into between the Amalgamated Clothing Workers of America on the one side and the Clothiers' Exchange of Rochester on the other. The agreement formally recognizes the right of the manufacturers to operate their plants on the so-called open-shop principle; to introduce changes in the technique of manufacture, so long as these changes do not

endanger the welfare of the worker; and the agreement further recognizes the right of the employer to secure continuous production. The employers recognize the right of the employee to a job without discrimination because of union affiliations; the right of workers within any shop to organize and affiliate with an outside organization; the right of workers to act collectively in dealing with the employers; and the right of workers so organized to be represented by spokesmen of their own choosing. stein shows how under this constitution machinery is established for the daily administration of the fundamental principles laid down in the agreement. There is a labor adjustment board made up of union officials and labor managers, presided over by an Impartial Chairman or industrial judge, who is chosen and financed by both sides. He shows that this cooperative plan is developing a new type of leadership within the union and a more enlightened, trained and self-disciplined personnel. The agreement is liberalizing both the workers and the employers. In reading this description of the functioning of the Rochester agreement, one feels that the chapter by Robert G. Valentine is prophetic.

Dr. William R. Leiserson, formerly Impartial Chairman of the Labor Adjustment Board of the Rochester Clothing Industry, in the chapter called "The Worker's Relation to Scientific Management," describes how the clothing worker reacts to management, and especially his innate fear of change. Dr. Leiserson suggests that it is well to study those who are leaders or officers of the union in order to discover the real science of management.

In the chapter on "The Manager, the Workman and the Social Scientists," Dr. H. S. Person describes the possible contribution of the workman and the social scientist as well as that of the manager to better management methods. Dr. Person holds that each of these, in the performance of a common function, possesses advantages and disadvantages not possessed by the others, and analyzes their characteristic merits and defects.

Edward A. Filene, President of Wm. Filene's Sons Company, of Boston, Massachusetts, discusses "Why Men Strike." Mr. Filene's conclusion is that in a political democracy the autocratic control of industry breeds strikes, and is in the long run impracticable; that the changing value of the dollar produces just resentment; that the present so-called capitalistic system needs to be brought up to date; and, finally, that the basic remedy for the

evils of industrialism, and hence for strikes, lies in making business a profession.

In the chapter entitled "Scientific Management as Applied to Corporate Structure," Henry S. Dennison, President of the Dennison Manufacturing Company of Framingham, Massachusetts, brings us again to the discussion of the application of the principles of scientific management to the whole field of corporate organization. He analyzes the four chief factors of our industrial system as capital, management, labor and the customer, and analyzes the payment made to each for its service, the necessary addition to cover normal risks, some provision in the nature of insurance, the problem of control and reward.



#### CHAPTER XIV

# THE PROGRESSIVE RELATION BETWEEN EFFICIENCY AND CONSENT<sup>1</sup>

BY ROBERT G. VALENTINE

The Efficient Shop.—Let us begin by getting clearly in our minds a picture of an efficient shop as we can easily construct it out of the principles laid down by Mr. Taylor and even out of the present attempts to apply those principles.

In my description of this shop I shall, for the moment, entirely ignore the human element as it actually exists in the shop and describe the people handling the operations of which I shall speak as people who, whatever they may be outside the factory, are, while in the factory, simply animate machines, people who have either been trained or trained themselves—it matters not which for our present purpose—to do their work with all the precision of the most marvelous engine and with all the automatic delicacy and grace and perfect adaptation to environment of the poised bird on the wing.

In such a shop first of all we should find Mr. Taylor's principles applied to the financial and sales ends of the organization. These applications I shall not pause to consider here (because, for simplicity's sake, we shall deal only with the strictly production problem) further than to point out that in any really efficient organization the high spots all along the line must be secured as to their efficiency before the more minute details are highly developed. A great deal of the scientific management in use at the present day, whether in sales, finance, production or personnel, is similar to the situation in which a great deal of money might be spent in curing of flat foot a person who had some disease of the knee which might lead to amputation. This lack of coordination is an excellent illustration of one of the basic inefficiencies which penetrates the world today.

Assume, however, that the ideal shop we are picturing to ourselves has avoided these insults to common sense. It will on its production side proceed to organize every single one of its

<sup>&</sup>lt;sup>1</sup>Reprinted by permission from the *Bulletin of the Taylor Society*, Dec., 1923, vol. 8, No. 6.

activities in relation to every other activity. That is the essence of the whole matter. That is the essence both of planning and of action in a shop. That is the essence of work analysis, of storeskeeping, of the layout of equipment, of routing, of functionalizing and of costs flowing steadily and thirteen times a year into the profit and loss statement as a by-product of the management practice itself.

In such a process of organization all former standards are revalued, all precedents are fearlessly analyzed; no process which has been improved upon is retained a moment longer than is necessary smoothly to install the better process. The crafts and trades as we have known them are progressively broken up under this process; work is ever more and more specialized and the steady tendency throughout, because of the fact of this specialization, is to need at any particular point of any particular operation the thinking, judging human being less and less, so that the mechanically and easily trained human being more and more is used, and more and more tends in his turn to give way to inanimate machinery. At the same time that this tendency is going on, the brain of the shop, as has been aptly said, is developing in the planning room until the shop is becoming as perfect an organization of relationships between brain and nerve and muscle as is the human body.

In itself all this is good and but the logical outcome of the introduction of machinery. It means lower unit costs and more wealth. Any force of society which attempts to turn back this progress, or halt or even slow it up is contending with the inevitable. Such a factory as we have outlined is unquestionably the type of the major production method of the near future throughout the world under any form society may take.

Reenter the Human Being.—So far we have no problem. But the moment that we substitute in the ideal factory which we have sketched the human being as he exists in the world today, we have our problem. People who have been no less pioneers and discoverers in the field of both general and social psychology than Mr. Taylor was in the mechanics of business organization have found certain principles as basic as Mr. Taylor's which spring from quite other roots. These equally fundamental principles center in this statement: The days of compulsion—the days of service without consent—are over. In tremendous areas compulsion still exists. We are still conscripted into the world. We are

still in great areas of our lives the unconsulted objects of powerful forces. With all our magnificent engineering achievements and somewhat slowly developing common sense, we are still individually and collectively the apparent sport of earthquake or lightning. When we have once decided to take passage on the sea, we have, so to speak, enslaved ourselves to the possible storms at sea. But in all those areas of life wherein man deals with man, great breaches have been made in the ranks of compulsion. We find, however slowly and haltingly, through the decades a steadily increasing assertion of the right both of the individual and of the individual in groups to give his consent to that which, from any other human quarter, he is desired to do.

Consent from the point of view of life in the factory has two main types; individual consent and group consent.

As to individual consent, in some cases it is of the type of the traveler who decides to take ship, abandoning at the factory gate, as the other does at the dock, the right of being consulted by the management as the other does the right of being consulted by the captain. In other cases, continuous rights of consent are still retained.

As to group consent, it is of two kinds: the consent of the factory group by itself, and the consent of the factory group as a part of an interfactory group.

The most casual study of the whole principle of consent will show that it always tends to strike its roots into wider and wider areas . . .

I think there will be little debate as to the general proposition that a free man—a consenting man—is the more desirable worker. Where we have broken down in imagination is in failing to realize that organized consent, as well as individual consent, is the basis of a more efficient group. We have been accustomed too much to think of democracy as almost necessarily a mere crude expression of untrained information through votes. Almost nothing has yet been attempted in building up a finer texture of democracy through self-training groups, constantly growing in strength through the consideration of scientifically accurate data.

Another error which we have lazily accepted as a failure of democracy is the idea of life as a fairly static thing. This error is clearest seen in the common statement that certain types of people, certain whole groups of people as well as certain individ-

uals, "are not worth any more." The reason they are not worth any more is largely because no adequate educational process has been tried. The theory is disproved by our immigrants when they are given the right chance. It is disproved in the tremendous progress the children in our schools make over the status of their parents. It is disproved above all by the absurd implication that human beings are less the field of the inventive organizer than machinery. More than any other one thing, life is an educational process, and it is only when life is artificially restrained, artificially hampered, that, because the educational process is lacking, we wrongly think of life as static and of classes as efficiency castes.

The problem, then, is to combine, not through failure to come to grips and not through hostilities but in constructively organized ways, the latest developments of efficiency in production with the latest developments of the science and art of democracy.

A primary standard, then, by which I should judge scientific management would be to consider whether or not the scientific manager and the student of social psychology, who, in shorter terms, might be called "the man of affairs," were jointly addressing themselves to the solution of this problem—the relation between efficiency and consent—in each particular industrial concern; and whether they were recognizing that the ultimate ideal will be the consent of the interfactory group as the only one broad enough on which to build stable conditions of efficiency cooperatively with adequate safeguards to insure that the human educational process shall not be turned back, stopped or delayed any more than efficiency shall be turned back, stopped or delayed. The educational problem is the fundamental problem of statesmanship and it is a minimum demand of that statesmanship that industry shall be a school of citizenship.

Conclusion.—Three points emerge clearly:

- 1. That craftsmanship in the old sense of the term is doomed.
- 2. That as craftsmanship can no longer furnish the base on which labor organization can grow, unionism, group action, will have to build itself up on a base as broad as the whole educative process itself instead of on the particular craft. Even today the real strength of unionism is that unions are effective consumers' organizations with a primarily educational interest. As this fact gradually sifts through the minds of employers and managers,

they will gradually see that the most inefficient thing that they can do is to fail to cooperate with such a great source of energy. The organizations of workers, on their side, can, when once that stand is taken, be counted on to consent to all that makes for efficiency. They will do this because in all legitimate enterprises—which are all enterprises where real service to the public is the test—the workers and the management will be equally concerned in perfecting the service. And at the same time, under constitutional industrial relations, they will contest the share in the management and the share of the product between themselves and with the consumer.

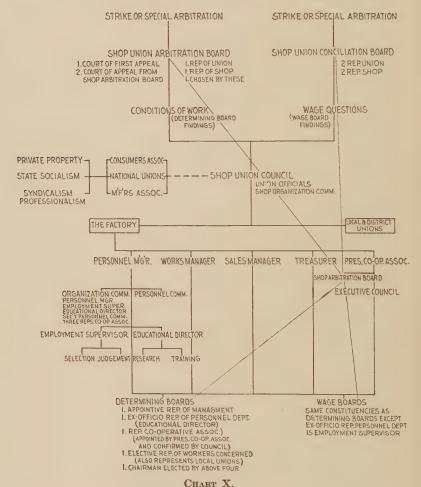
3. That the interrelation of the forces we have outlined—the forces of efficiency and consent—is constantly taking place in the world today in all kinds of crude and unorganized ways. Here and there real elements of interorganization between efficiency and consent appear. But for the most part the labor agreements in operation today are looked upon by employers as a necessary evil and by the workers as steps in their assertion of their rights as consumers and having little detailed relation to production processes. The beginnings of something far better than this are seen in the agreements in the garment trades wherein the manufacturers, the workers and the public are all represented as parties; and in certain kinds of organization which are being worked out in a few business concerns. There is still too little of real accomplishment in this direction to enable us to predicate with any certainty what the course of the development in details of organization will be by which efficiency and consent are made continuously revitalizing agents for each other.

Yet I believe that the point has been reached where it is profitable to attempt to gather together such experience as has been gained and relate it to the probable development of the next few decades.

With this purpose in view, I submit Chart X.

This chart, it should be constantly borne in mind, is neither a dogmatic nor propagandist document. It is merely a working hypothesis by which to test out the facts of business as they occur daily at the desks of managers and at the trade union council tables, or in the occasional assemblages of unorganized labor. The whole aim of this discussion, as I see it, would be falsified if we deluded ourselves into believing that in any seeming array of facts we had found the truth. The only unforgivable thing

would be that we, as social scientists, neglect to take into consideration any facts of the moment connected with all the forces that do exist; the only thing that seems to me axiomatic is that, when forces do exist, they are better when organized, trained,



educated, developed and enlisted in an effective way—anything you like—rather than allowed to play among and upon us blindly.

The picture of these forces submitted in this chart may be summarily commented on, as follows: In every form of factory there are human forces at work which, whether they are organized or not, are of at least equal importance with the forces governing

sales, production and finance. These forces take the two aspects of relationship to a growing intelligence on the part of the managers and a growing intelligence on the part of the employees.

Where these forces are organized, they may take the form shown on the chart under the "Personnel" heading at the left end of the "Factory" line and under the "Cooperative Association" heading shown at the right end of the "Factory" line. The relation between efficiency and consent is provided for in the form of organization shown, through the relationship between the research department of the education division and the determining boards and wage boards. The research department is where plans of organization are worked out and where work analysis is done. The determining boards and wage boards, acting on the scientific facts put before them or the nearest approximation to such facts that can be obtained, sanction the findings in the interests of all concerned.

The facts thus put by the research division before the determining boards and wage boards furnish the material for the whole structure of organization and become an inescapable factor at every debatable point. Thus, if appeal be taken from any findings of a determining board or wage board to the arbitration board shown on the chart, the case is necessarily considered in the light of the best available facts.

Related to the factory, sometimes by formal agreement and sometimes through the entirely unorganized relationships of its individual members, are the local and district unions, or even the mere incoherent thoughts and feelings of unorganized labor. As organization begins to take any shape at all, it begins to crystallize into some form of a shop-union council wherein the interests of the factory and of the local and district unions are to some extent formally organized. In such forms of organizations as the garment trades, the shop-union relationship has formally added to it the third relationship of the public.

The questions which come before such a shop-union council divide broadly into questions affecting the conditions of work and questions affecting pay. In the shop-union council's consideration of these questions, the findings of the determining boards and of the wage boards are before it, so that here again the best available facts necessarily form the material of the discussion.

As to conditions of work, experience so far tends to show that all questions are arbitrable; namely, they are capable of being decided by an impartial third party on the basis of the facts presented.

Questions of pay, on the other hand, are still so unsupported by scientific basic facts as to be a matter of conciliation rather than of arbitration.

It will be seen in the chart that appeal lies from the shop arbitration board to either the shop-union arbitration board or the shop-union conciliation board.

At this point, it should be emphasized again that nothing on this chart indicates anything artificial in organization. The attempts that are going on, so far as the chart expresses them, are attempts to strengthen and make saner and sounder the organization of untamed forces which do exist.

This point should equally be borne in mind in the relation of the shop-union council as depicted on the chart to those natural forces which exist in society at large in a more or less unorganized state; namely, consumers' control, whether private or public, the national and international labor unions and manufacturers' associations. These present-day forces of social and industrial organization are in their turn more or less crude expressions of three underlying forces shown to us by social psychology, which will in all probability work out between them the society of the future. These three basic drifts appear to be:

- 1. The fundamental soundness of the principle of private property. This element takes into account the fact that it is a basic instinct of human nature for the individual to desire possession.
- 2. The force of state socialism. This force takes into consideration the fact that it is equally a basic instinct of human nature to desire to work out things in concert with one's fellows. An excellent example of state socialism at present in practice is the public school system.
- 3. The force of syndicalism. This force takes into consideration that basic instinct of human nature which leads us to desire to share in the control of the methods of production in which we are concerned and in distribution of the product. An excellent example of this instinct in present-day practice is supplied by the whole field of professionalism as seen concretely in medical societies and bar associations.

Such a study as we have outlined here of the forces at work in the world, and of our duty to attempt to organize them exactly

as the student of electricity has organized that force, makes it the job of the industrial statesman to recognize first of all that there are facts of democracy as well as facts of efficiency, and to see to it, so far as it is humanly possible, that each group of facts is related to the other in organized and efficient ways.

Applied scientific management, then, which does not relate its science to the desires and to the thoughts of all connected with a concern in all their relations, either organized or in process of organizing, is not true to the Taylor principles.

# CHAPTER XV

# CAN INDUSTRIAL DEMOCRACY BE EFFICIENT? THE ROCHESTER PLAN<sup>1</sup>

# BY MEYER JACOBSTEIN

In the city of Rochester we have from 15,000 to 20,000 employees in the clothing industry. For 25 years we have had organized opposition of employers to organized opposition of labor. The industry has been highly disorganized on its technical side. From a scientific point of view it is still a backward industry.

Our industry employs a mixed population. The racial elements are extremely varied, with the Italian and the Jew predominating. But, in spite of the diversity, we found in a recent census that two-thirds of all our people were citizens, either native-born or naturalized.

The clothing manufacturers of Rochester, looking ahead, felt that they ought to take the initiative in building up a sane, sensible and scientific industrial relationship in the industry.

The Clothiers' Exchange of Rochester, comprising some 19 manufacturers, in whose plants work something like 15,000 people—these manufacturers with no strike on their hands, with no aggression on their part or aggression by employees, sent for Sidney Hillman, the President of the Amalgamated Clothing Workers of America.

The employers said to Mr. Hillman: "In view of the fact that you do not represent all of the workers, we will deal collectively with those workers in our plants who are members of your union." At that time only about 25 per cent of the workers belonged to the Amalgamated. So they said to Mr. Hillman: "We will let you speak authoritatively for those in your own organization."

An arrangement was then entered into between the Amalgamated on the one side and the employer on the other. A contract was drawn up not by lawyers but by men who were in the front-line trenches, men who were face to face daily with the labor problems in a practical way. The agreement drawn by

<sup>1</sup>Reprinted by permission from the *Bulletin of the Taylor Society*, Aug., 1920, vol. 5, No. 4.

laymen is a two-page, typewritten document expressed in the simplest language.

Terms of the Agreement.—The agreement was based on the fundamental proposition that both parties had definite rights and certain definite responsibilities, recognized and respected mutually. At the very outset the union recognizes the employer's right to manage his own business without interference, so long as the interests of the workers are not jeopardized. The rights of management are recognized in the very first paragraph of the agreement, which reads as follows: "The union concedes and recognizes the right of the manufacturers to operate their plants on the so-called open-shop principle." Most labor leaders would have refused to recognize the open shop, but Mr. Hillman was wise enough to look at the matter differently. When the employers asked for an open shop his reply was: "I don't care what kind of a shop you have so long as you do not discriminate against union workers getting jobs in that shop and so long as you permit the workers in that shop to organize and choose their own representatives." Under this open-shop principle, which has existed not merely on paper but has actually operated, we have been free to select such labor as we chose to engage, without regard to union affiliation. In the selection and promotion of labor, fitness for the job has been the sole test.

The agreement recognizes the right of management to introduce changes in the technique of manufacture so long as these changes do not endanger the welfare of the worker. The agreement further recognizes the essential right of the employer to secure continuous production. There have always been too many stoppages in the clothing industry. To secure uninterrupted production, it was necessary for the union to abandon its most powerful weapon, the strike. The agreement very definitely outlaws the strike as a weapon of industrial warfare. This does not mean that, because the agreement declares stoppages illegal, the Rochester market has been free from stoppages. On the contrary, it was just because we expected walkouts that machinery was installed to handle stoppages when they occurred. We knew that in the ordinary course of events such stoppages would occur, as indeed they have occurred. But a great deal was gained when the union recognized very clearly that it was essential to outlaw the stoppages as the usual method of procedure in enforcing demands.

In the agreement, therefore, the employers secured from the union recognition of these fundamental rights which belonged to management:

1. The right to hire labor on the open-shop principle.

- 2. The right to carry on production methods consistent with the most progressive scientific principles.
  - 3. The right to continue production.

On the other hand, labor, too, has rights, and their rights were very clearly recognized by the employers in the agreement, as follows:

- 1. The right to a job without discrimination because of union affiliations.
- 2. The right of workers within any shop to organize and affiliate with an outside organization.
- 3. The right of workers to act collectively in dealing with the employers.
- 4. The right of these workers so organized to be represented by spokesmen of their own choosing, the understanding being that these elected representatives need not be workers within the plant.

It was also understood that, in view of the fact that the union gave up the right to strike, the employers surrendered the use of the lockout as a weapon of industrial warfare.

The agreement, therefore, merely sets forth the basic principles upon which we are cooperating in Rochester. It is our constitution.

The value of the agreement, however, is not what is in the agreement, but what is done with it. It too frequently happens in collective-bargaining arrangements that an agreement is drawn and signed and tucked away in the safe and never used until an emergency arises. In Rochester we desired an agreement which would function every day in the year and, therefore, we entered into an agreement which provided for the establishment of machinery which would make the agreement a living thing. The mere declaration of democratic principles is not enough. If democracy means anything, it has got to work.

The Machinery of Administration.—Therefore, to make this democracy work, we established machinery for the daily administration of those fundamental principles laid down in our agreement. The employers have a strong organization, known as the Clothiers' Exchange of Rochester. This manufacturers' organization delegates to a labor committee, composed of the heads of

the five largest firms, authority to shape its labor policies. These labor policies, in turn, are administered by labor managers representing the 18 manufacturing concerns comprising the Clothiers' Exchange. It is a very interesting fact that, whereas in most industries the employment supervisor, the labor manager or the industrial relations manager is regarded with a great deal of suspicion by labor leaders, in the clothing industry the labor organization not only indorsed the establishment of the labor management idea but encouraged it as well. In fact, the labor management idea is part and parcel of the whole cooperative undertaking. The labor managers are called upon to help shape the labor policies in the entire market and to administer these policies in their respective factories. In most of the large plants the labor managers are fortunate in having the services of technical experts, including production managers.

The labor managers meet at frequent intervals in order to secure a reasonable amount of uniformity in the administration of market labor policies.

Standardization in employment procedure is secured through cooperative joint action on the part of all the labor managers. The Clothiers' Exchange operates a Central Clearing House which supplies employment and statistical data to all the labor managers.

The workers, on their side, are equally well organized to administer their end of the labor policies. The Amalgamated is an industrial union. The various crafts have their local unions, but the local unions, in turn, are consolidated into a Joint Board, representing all the organized workers in the industry in Rochester. The Joint Board elects a general manager. The general manager has a staff of business agents and, in addition, has the assistance of national organizers who are assigned to Rochester by the national headquarters. The general manager and his staff function for the workers very much as the labor managers function for the employers. Technical price committees, made up of practical workers, meet with the price committees representing the employers. The time is rapidly approaching when the union will probably be forced to use its own time-study men on its price committees.

Where the employers and the workers are strongly organized and determined to defend their rights, it is natural that conflicts should occur. In order to overcome the friction that inevitably must arise in the ordinary course of business affairs, we have provided for an Impartial Chairman, who acts as an umpire. This umpire, or industrial judge, is chosen and financed by both sides. His decisions are final and binding on both parties. Whenever a dispute arises between the employees and any firm which cannot be settled through friendly negotiation between the labor manager and the business agent, the case is referred to the industrial court for adjudication. Dr. William R. Leiserson, as Impartial Chairman, rendered about 150 decisions during the first year of the agreement. Practically all these decisions were handed down without special reference to the written agreement. The cases were decided, for the most part, on their intrinsic merits rather than on the basis of technical phraseology of a legal contract.

Practical experience has shown us that a constitution is in constant need of interpretation. To meet this need, we have created a Labor Adjustment Board, made up of union officials and labor managers. This board meets once a week and is presided over by our Impartial Chairman. The employers' and the workers' representatives meet in joint session for the purpose of interpreting our basic principles. In order to meet the practical problems which arise, it is often necessary to enact new legislation consistent, of course, with the original agreement. Frequently it is necessary to assist the judge in shaping his decisions. As a matter of actual fact, the most important decisions handed down by the Impartial Chairman are crystallized in these sessions of the Labor Adjustment Board. In the usual run of cases there is a meeting of the minds and the Impartial Chairman expresses the understanding over his signature.

The machinery is in action all the time. To a superficial observer the constant functioning of the machinery in the settlement of disputes might be disturbing, as indicating, perhaps, a diseased condition within the industry. To my mind it is a very wholesome state, for it indicates that the instrument is vital and flexible and able to cope with the everyday problems of industry.

A mere listing of the questions that are thrown before the Labor Adjustment Board and the Impartial Chairman is significant. What is a fair piece rate on a given operation? What is a fair production standard for a weekly wage on a given operation? Has there been discrimination against a union worker? Has

a worker been discharged arbitrarily and unreasonably by the employer? How shall an unruly worker be disciplined in the shop? How shall an unruly employer be disciplined by the worker? When work is slack, shall the employer discharge help or give an equal distribution of work to all? Can the union compel an employer to discipline the violation of the union rule by a disobedient union worker? How shall women be paid on jobs ordinarily held by men? Has the employer a right to introduce a new machine or cause a change in the method of production in an operation? All of these questions and many more have been met satisfactorily by our machinery.

One of the outstanding virtues of the functioning of our machinery is the fact that those who are operating it are in close touch on both sides with the rank and file of the industry. There is practically none of that red tape so evident in a bureaucratic organization.

I have described thus far the basic principles which underlie the agreement and the machinery established for carrying out these basic principles. Is it a success? Is this particular form of collective bargaining actually producing results?

Success of the Plan.—First, our democratic plan of cooperation is succeeding to the extent that it is building up a capable, efficient and constructive leadership on both sides.

Let me indicate what I mean by that. Fifteen thousand employees elect representatives known as shop chairmen in each plant. Those leaders elected by the rank and file have to make good or they get out. The inefficient are quickly deposed. The workers make effective use of the recall in their organization. They don't have to wait for a four-year election period to remove a man from office. They can recall him at any time. There is a wholesome degree of labor turnover among leadership in this industry that makes for security and responsibility.

The leadership works itself out in curious ways. In the very first case we had before the Impartial Chairman, a young Italian leader, the most radical in the group, represented the workers. Later he became a business agent, and then his troubles began; instead of merely delivering keen, sarcastic tirades, he had to put things across for his workers, consistent with the principles laid down in our agreement. He found that somehow or other his own convictions and his own temperament couldn't enable him to represent his people and be fair to the employers. He became

unhappy in the situation and felt he would not make good. He therefore resigned. He deposed himself because of his incapacity to make good under the circumstances.

The safety of this leadership arises from the fact that it is coming up from the ranks. This makes for a self-perpetuating leadership within the union, not superimposed from without. Of course, there is an educational influence emanating from the national organization, but all the time the leadership is developing from within and from below, which makes for safety in the industry.

But leadership alone is futile. A leader, however competent, must have back of him the force of enlightened public opinion. He must have the citizenship of the industry brought up to a level where it will appreciate the highest standards of leadership. Otherwise we shall get demagogues.

Not only is the democracy of Rochester developing leaders who make for safety, but, in the second place, it is developing trained citizens—trained citizens who are informed, enlightened and disciplined.

The very fact that the workers elect their own representatives makes them interested, watchful and careful. They learn from experience that the actions of their elected representatives affect their daily welfare in a very concrete way. Therefore, the workers are watchfully studying the acts and record of every leader. They insist on being informed in order to select the right leaders. In fact, the safety of our entire arrangement lies in the fact that the rank and file is continuously clamoring for information and knowledge regarding the problems which affect their own welfare. The more enlightening they become, the more they realize the importance of selecting proper leaders to represent them.

One of the most wholesome things in the industry is the manner in which employees are disciplined by their fellow workers for violation of some principle mutually agreed upon by both parties. For instance, a worker will sometimes attempt to secure an advantage for himself, perhaps at the expense of his group, through individual bargaining—a violation of the rule that calls for collective bargaining. That self-seeking individual is taken to task and duly impressed with the fact that in this industry one is not permitted to get something for oneself at the expense of the larger group of which one is but a part. This develops a social consciousness in the industry. When that idea becomes planted

in a worker's mind he has been made a more socially-minded individual, better equipped to meet the problems beyond the factory walls.

Our cooperative plan, therefore, is developing an enlightened, a trained and a self-disciplined citizenship. An intelligent, self-imposed discipline of the democratic character referred to above will make for a higher form of industrial efficiency in the long run than that type of Prussian discipline which is purely mechanical and superimposed by officials vested with superior authority.

In the third place, any plan of industrial organization, to be permanently successful, must be technically sound. This practical test must be applied to any form of industrial democracy. We feel that our cooperative, democratic movement in Rochester has a factual and not a visionary basis. A capable leadership and a trained citizenship would get us nowhere in our experiment if the employers were prevented from introducing into the industry new machinery, labor-saving devices, progressive management methods. If the labor organization stopped the manufacturers from making technical progress, the whole system would inevitably collapse. The permanence of the plan will depend ultimately upon the question whether or not the employers are going to continue to be free to apply scientific management at whatever point the industry is prepared for it.

Thus far our arrangement and machinery have possessed sufficient elasticity to enable the manufacturers to be technically progressive. New types of machines have been introduced in the factory; all sorts of labor-saving devices have been installed; operations have been subdivided so as to make for greater economy in production by giving unskilled work to the less skilled operators; production standards have been worked out for many week-work operations.

There is much that is still lacking in our plants. For instance, we have as yet no central production control system. We have no routing and dispatching in our plants. We have not worked out a stores-keeping or materials classification system. But these deficiencies are not due to the collective-bargaining arrangement, but to the state of the industry, which has been backward technically for decades and is only beginning to see the light.

Our cooperative enterprise, however, is laying the groundwork for the introduction of scientific management methods in a very salutary way, because when new methods are introduced today they are done with the willing consent of the workers and not imposed upon them arbitrarily and autocratically. We are preparing the soil which will make it easy for production experts to reap the harvest when the proper time arrives. In a word, we are constantly "selling" the concept of scientific management to the workers not by thrusting it down their throats but by winning their consent by persuasion, reason and practical demonstration.

The hard-headed critic, however, still says: "Has your industrial democracy reduced the cost per unit? Has it increased production per man-hour? Has it reduced labor turnover?" The experiment has been operating too short a time to give categorical and thoroughly satisfactory answers to these questions. One thing is certain—that so far as the data are available our records show that the arrangement has stabilized the working force and has reduced labor turnover. This reduction in the labor turnover is especially worth mentioning, in view of the fact that it occurred during a period of the greatest labor shortage in the history of the clothing industry. You will appreciate this all the more if you will recall how labor turnover increased in the munition plants and shipyards during the war period when there was an acute labor shortage.

As to production per man-hour, it is not easy to give an answer to this question, because very few plants up to a year ago kept such data as to enable us to make a comparison. Stoppages have been greatly reduced. There has been a wholesome amount of shifting from day work to piece work. Week workers, or day workers, have been induced or forced to report regularly their production records. Standards of output have been set and accepted by the union for week workers where the piece-work basis is not satisfactory. I feel sure that in several of the large plants the production per man-hour has been maintained during this first year of experimentation. In the smaller so-called outside-contract shops the production per man-hour has not held up so well as in the inside plants. The aggregate production was affected by virtue of a reduction in working hours from 48 to 44 per week. However, a number of departments in several plants secured as much production in 44 as in 48 hours. In the light of the great falling off of production in many lines of industry, including those industries which do not have collective bargaining, I feel that our record along production lines has not been unsatisfactory.

Bear in mind that our experiment is young. There are many weaknesses in the plan which will have to be eliminated as time goes on. We have been experimenting with political democracy for 130 years and still we do not feel that we have completely arrived. It is only fair, therefore, to ask that you be patient with our experiment in industrial democracy.

# CHAPTER XVI

# THE WORKER'S REACTION TO SCIENTIFIC MANAGE-MENT<sup>1</sup>

# BY WILLIAM R. LEISERSON

Let me give a few illustrations as to how workmen react to management. We have had in the clothing industry some trouble when new machines have had to be introduced—say pressing machines. Workmen are used to working with hand irons, and when a machine is introduced they think it will take their jobs away, and they object. Employers want to insist on their rights of putting in new machinery, and they say the workmen who are opposed to new machinery are opposed to progress, and it looks as if they are right. But are they?

In Boston a short time ago an employer tried to put some hand irons into his factory. In that city they had been doing pressing with machines for several years, and one manufacturer wanted to go back to using hand irons. The pressers thereupon threatened to go out on strike. They might have said: "We are striking because the employer is opposed to improved machinery and wants us to go back to the old and antiquated methods." If the workmen had said that, they would have been just about as right as the employers are when they say that workmen or unions are opposed to the introduction of new machinery. The manager ought to know that every human being, no matter how radical he is, is instinctively afraid of change, suspicious of anything that is new.

If the management is really scientific, when it has two such facts before it—workmen opposing machinery and workmen insisting on machinery—the obvious conclusion is that it isn't the machinery, but it is changing methods, changing habits, that they object to.

Let me illustrate by cases that come before our court. In our industry in Rochester, the predominating nationalities are Jews and Italians. Now, Jews and Italians have altogether

 $^{1}\,\mathrm{Reprinted}$  by permission from the Bulletin of the Taylor Society, Aug., 1920, vol. 6, No. 4.

different mental processes and you cannot make them understand the same proposition by putting it to them in the same way.

The Jews don't care about decisions. When they get stuck in negotiating with the employer they come to the court to get assistance so that they may continue the negotiations and reach an agreement. They want to bargain and adjust the matter. They have a bargaining psychology—years of that kind of tradition back of them. The workers say: "The price of this is 50 cents," and they think it ought to be that. The employer says: "It is only 40 cents." He knows full well that the workers are not lying; he knows that they have put the price higher with the expectation of bargaining. That isn't lying. That is business.

The Italians have quite a different psychology. They haven't had so many years of business experience. Their's is not a business psychology. They haven't any bargaining instincts. Their psychology is rather, as it appears in court, that of a sense of honor, handed down from days of chivalry. If an Italian says this is worth 50 cents, even though he may have made a slip and it really isn't worth 50 cents, he doesn't look upon the statement as a bargaining bid. When, therefore, the other fellow says it is worth only 40 cents, he thinks the other man is calling him a liar. And he does not want to negotiate. He comes to the judge and asks: "Am I right or am I wrong?" And he will stand for any decision that an outsider will give. He wants the outsider to settle this affair of honor between him and the other man.

The union people, those who survive in the union membership as leaders or officers of the union, are the best people to study when it comes to finding out the real science of management, because, in order to survive as leaders, they have to make their own working people, who are their employers, do the things that the officials see they have to do under the agreement, and yet they must convince the working people from their point of view.

So when you approach a class of people you must discover their "apperceptive mass," as the psychologist calls it. What is the mass of experience in the back of their heads that interprets every word that strikes them? Each person, each group of persons, has a different mass of experience of this kind, and when he hears something it creates a somewhat different impression from that which others get, and you must find out what these various impressions are when you want to get any particular thing over to different people.

Fear of Change.—One of the things that people are most afraid of, psychologists will tell you, is the unknown, the fear of change. In many clothing factories the practice of counting the work done has not been followed, and when the workers are told to count their work they get scared, even though, under their agreement, the firm may have a right to have its work counted and recorded. But this seems a revolution—no matter how revolutionary the workers are, they are afraid of change.

We had a great deal of trouble in one particular shop in getting the people to count their work. When the union official told them: "They have a right to count the work, you cannot object to it. What are you afraid of?" They said: "We don't really object to the counting, but what we are afraid of is what that fellow has in mind when he wants us to count the work. We never did it before and he must have something else up his sleeve or else he would never ask us to count the work."

In another shop of the same firm a real revolution was inaugurated by the employer. A system of scientific management was introduced in the shop. It was a complete change from what they had done before, but it wasn't sprung on the workers. It was talked about for two or three months in advance and they learned to know that it was coming and what it was likely to do. This really important revolution in the methods of doing things came about with some grumbling, to be sure, but was accepted without any great amount of trouble. On the other hand, the unimportant minor matter of having the work counted caused a great rumpus.

The workman has constantly in his mind what is a fair and honest day's work, and you can't set wages by time study or by any other scientific method that does not take into consideration the worker's judgment of fairness in this thing. You have got to measure that. This is one of the elements, and if you leave that out you haven't a proper wage; because, no matter how scientifically you measure it, he is going to give the day's work that he conceives fair and honest and he is no more dishonest than the managers are. He has his idea of justice and fair dealing in a day's work, and the managers have their ideas of justice. A really scientific method of fixing wages is one that will put together the management's idea of a fair rate and the workman's idea of a fair rate, and I don't see any other method of doing that except through collective bargaining.

The employer who is supposed to have intelligence, ability, all the knowledge of the market—he never trusts to his own ability: he hires experts. He hires these experts to fix wages for him because he feels he doesn't know enough about it. Then he denies to the employees the right to hire the same sort of people to help them fix rates for their side. There is no way under individual bargaining, or under any one of these shop committee plans which insist that the wage-earners must be represented only by people from within the plant (which means by the same kind of uninformed people as they are), for workmen to bring in an expert from the outside to help them fix wages. There is no scientific management expert to stand up to the boss and say: "This thing is worth so much from our scientific point of view." The only way working people can have equal opportunities with employers in hiring expert scientific services for their side is for them to join an organization, chip in and pay dues, and hire a union official who is their labor expert to deal with the employers' labor expert. There can be no scientific rate fixing unless both sides are represented and both points of view are equally considered in measuring what is a fair day's work for a particular operation. That can only come through collective bargaining of some kind.

I am saying this to illustrate that it isn't the things the working people stand for or object to at any time that matter; it is rather that they have certain attitudes of mind which come from certain situations they happen to be in, and when those situations are changed their policies and beliefs also change.

In conclusion, I want to say that it is important for management to understand that this change in attitude is constantly taking place either because of the union, because of shortage of labor, because of rising prices or because of any number of things that happen. And the manager who doesn't see these things changing and thinks that he can follow one policy in managing human beings is bound to have trouble with his employees.

# CHAPTER XVII

# THE MANAGER, THE WORKMAN AND THE SOCIAL SCIENTIST<sup>1</sup>

BY H. S. PERSON

It is my thesis that no one of these individuals—the manager, the workman and the social scientist—sees the problems of scientific management with an eye which reveals the whole truth; that each is, by some economy manifest in the unconscious organization of persons for the investigations of truth, a functionalized observer of industrial facts and judge of their significance; that each is complementary to and essential to the other.

Each of these examining and appraising agencies—manager, workman and social scientist—in the performance of the common function possesses advantages and disadvantages not possessed by the other two. What are the principal advantages and disadvantages of each?

#### THE MANAGER

The manager of a business is one who performs the social service of adjusting the creation of certain utilities embodied in commodities or services to the demands of individuals for those utilities, in a manner economical of human energy and equipment. The allowance which society makes to him and to his family as a reward for this service should enable him and his family not only to live but also to enjoy certain things which make life to them worth living. The amount of this allowance is determined in most instances (I do not wish to go into refinements) by the degree to which he is economical of human energy and equipment. That economy is popularly called "efficiency." To succeed in putting together economically the energy, skill and materials necessary to create commodities or services is no easy matter. In the first place, a very small change in conditions causes the manager's operations to pass from an efficiency which society approves and rewards to an inefficiency which society may not only refuse to reward but for which it may exact a penalty.

 $^{1}\mathrm{Reprinted}$  by permission from the Bulletin of the Taylor Society, Feb., 1917, vol. 3, No. 1.

In the second place, the elements which the manager must unite in his operations are not stable, and a combination which may be economical at one moment may not be so at the next. There are two results of this instability of elements with which the manager works and of this narrow margin for social approval within which his variations in economy are confined. One is the constant, concentrated attention he must give to the varying elements and their varying combinations—a confinement which deprives him of the opportunity for developing breadth of view. The other is the effort to minimize these variations in elements by standardization of one sort or another, an effort which incurs the danger of his achieving an apparent but unnatural stability, which results, without his perceiving the reasons therefor, in maladjustments to the changing industrial world in which he operates.

This simple description of the nature of the manager's function makes it apparent that in valuing industrial mechanism, processes or policies he suffers disadvantages and enjoys advantages which are unique to him.

There seem to be four disadvantages:

- 1. The fact that the manager's attention is concentrated on the unstable elements of his business—the varying details. I admit that the supervision of many of these details may be delegated, and to the extent that they are delegated the manager frees himself from this limitation. But those who thus free themselves are so few as to be conspicuous. This concentration on the technical aspects of the business denies to the manager opportunity to observe the great facts of social and industrial evolution. He may not keep up even with the development of human thought concerning the very service which he performs for society. He has but little time to acquaint himself with the results of investigations of others. He has but little time for books which are the records of the investigations and thinking of others. He has, in fact, but little time for newspapers and other periodicals. Lack of time from business is too frequently as fatal for him as lack of education for many others; he falls into the habit of accepting statements of facts of industrial evolution which are not true, and opinions of others concerning economic principles which are not sound.
- 2. The very nature of his responsibilities compels him to regard and to value all things from the point of view of profits. In most

nistances he is wholly unaware that there are other standards of valuation of the mechanism, processes and policies, which he is called upon to consider. In those instances in which he may feel there are other standards of valuation, he is too often unable to free himself from the insistent demands which the problems of the ever-changing elements of his business crowd upon him to inquire what those other standards may be. His is a business in which he who hesitates is lost, and he therefore may not stop to work out more than superficial changes; he may not stop to inquire about the fundamental principles of his own managerial activities.

- 3. He is subject to the tendency to seek relief from changeability and uncertainty in the elements which he controls by unconscious overstandardization of all of those elements. Some of them—the material elements—by their nature may be standardized, and their standardization brings relief. Others, such as the quantity and quality of demand and the human elements in production, do not lend themselves to the same kind or degree of standardization, but he too frequently fails to perceive distinctions and attempts to reduce these elements to the same kind and degree of control as he applies to others. The result is a mass of new problems added to those with which he is already overwhelmed.
- 4. He is subject to the danger of regarding all the elements which he directs as commodities, and of failing to recognize that spiritual factors are involved. Particularly, he too frequently fails to recognize that labor as a simple physical force cannot be separated from labor as a distinct and original seat of human intellect, feelings, desires and opinions. Labor as a spiritual force is the most subtle and changeable of all the factors which he combines for the purpose of service through production.

These are the limitations, suffered in various degrees by various managers, which seem to me to render it impossible for them to see the whole truth in estimating new contributions to industrial progress. However, these are but limitations to conspicuous advantages. What are the manager's advantages?

I shall not dwell upon the most significant of his advantages. They are well known and come immediately to mind. They proceed from superior intelligence combined with experience in the conduct of industrial operations. Most managers are men of great natural ability, which is made more effective by technical

or other training. Those who have not had the advantage of formal training enjoy perhaps compensating superior natural ability, which has enabled them to forge ahead in managerial operations, which has caused them to be set aside by natural selection as industrial leaders. Intellectual ability, disciplined by experience in the industrial field, makes them the keenest observers of industrial facts and renders their judgments in the treatment of industrial problems the soundest. I do not do more than indicate these advantages, dominating as they are, because they are so patent.

His other advantages may be summed up in the statement that the industrial machinery is a result of evolution; that at any one moment it is a complex of numerous, finely adjusted parts: that a slight maladjustment of the parts may bring disaster to many individuals and a major maladjustment may bring disaster to society; that the changes of evolution must be accomplished by small steps and while the machinery is in operation; that the manager himself is a part of this complex machinery; and particularly that he senses all the complexity and delicacy of this industrial machine and the necessity of the avoidance of even slight maladjustment. He senses these facts even when he does not attempt to explain them, because he has grown up in the midst of them—is of them. He has vast technical information and specially developed faculties which operate in the plane of industrial processes. In the solution of many of his problems, he does not have to rely on the conscious exercise of reasoning powers or the conscious application of rules and directions; he holds subconscious intercourse with the laws and principles behind his problems, and solves them "on the wing." Otherwise the solution of many of them would be impossible; the opportunity to solve them would vanish before investigation and deliberate reasoning could become operative. As the driver of a motor bus evolves a sense for velocities and distances which enables him instinctively to make openings which are to the passenger apparently impossible, so the manager develops special senses which enable him instinctively to estimate the adaptability to industrial processes, and the influence on them, of new mechanism, processes or policies. To those not performing the managerial function, this technical information and these special senses are denied. It is possession of this technical information and of these special senses which makes the manager the "practical" man.

intuitive judgment of the practical man is as reliable and necessary as the consciously reasoned judgment of other men.

These advantages enable him to discern aspects of the truth, in considering the effects of new industrial mechanism, processes or policies, which other judges are unable to see.

# THE WORKMAN

It has been the traditional opinion, developed through long social experience which it is not necessary to examine here, that the workman, because workman, has no occasion to examine and pass judgment upon new industrial processes or policies. It has furthermore been a traditional opinion that he could not exercise sound judgment in such matters if called upon to do so. The workman has been looked upon as possessing a commodity which he sells to the manager, as the farmer sells wheat to the miller. While it has been recognized that when the workman offers labor for sale he offers not only physical energy but with it a combination of mental and manual dexterity called skill, nevertheless, the traditional opinion has not risen to the conception that labor has any other interest in the transaction than the sale of a commodity. During recent years an entirely different opinion has been developing, and is held not only by working men but by many social scientists and by an appreciable number of enlightened managers. To attempt to account for the development of this new point of view would take us too far afield. majority, I imagine, of those who entertain it qualify it with the condition that, while in principle the workman is entitled to examine and pass judgment upon the manager's disposition of his labor, in practice that is impossible because the workman is not qualified by managerial experience to make such examinations and pass such judgments. A minority, on the other hand, advocate the new point of view without such qualification, and assert that labor is entitled to exercise the right of acting under the principle, whatever the degree of skill he manifests in making judgments; that he will learn to make better judgments on managerial matters by experience and responsibility; and that society, even at the cost of a temporary period of less fruitful management (conceded for the sake of argument), should bear the cost of the workman's apprenticeship in managerial responsibility. They assert also that life is more important than industry. happiness more important than profits and that happiness can

be secured only by giving every individual opportunity for the exercise of all his interests and the development of all his faculties, one of which is the faculty of managerial and creative activity. They assert further that the increased technical productivity resulting from the exercise of such a function by workmen, together with the increased productivity resulting indirectly as the result of greater cooperation, will more than compensate for the loss resulting from errors in judgment during the period of labor's apprenticeship in managerial responsibility. Finally, they assert that in our society and with our form of government, with labor self-conscious, organized and numerically strong as it is, experiments in the participation of labor in management are sure to be made, experiments which management should anticipate, and in which management should fearlessly and honestly cooperate. Assuming that to be the case, let us ask ourselves what may be the workman's competence to be judge of the desirability of new industrial mechanism, processes and policies.

The limitations of the workman may, I believe, be summed up in two characteristics: the narrowness of his individual attitude of mind, and the militancy of his organization attitude of mind.

An honest recognition of the facts makes it necessary to observe that, however noble and honorable of character, the great majority of working men have enjoyed neither the education nor the experience to render them broad and sympathetic in their views, informed concerning industrial facts, principles and tendencies, and possessed of trustworthy perspective and sense of values. The truth of this statement is possibly a damning indictment of society, and the fact that occasionally able men and even intellectual giants have risen from the ranks of working men, and that the prospects for all are improving, does not make it less so. The average working man has had to leave school at an early age, to begin the long struggle of support of self and family in a régime of the bartering of labor as a commodity, in which the advantages of bartering have been against him. He has had to rise at early hours and put in long days at the factory. He has returned at night weary, thinking principally of the sleep which will restore him for the morrow's work. So it has been, day in and day out. His work has been almost entirely repetitions of more or less automatic operations which have required

neither wide contacts nor serious thinking. His function, howsoever socially important, has been a relatively simple one, and has not given him wide acquaintance with persons and things and ideas. His limited education has not given him the impetus, and the weariness of his evenings has not allowed him the inclination, to seek contact with things and ideas in the written records of others. Is it surprising, then, that he is not appreciative of the complexity of the industrial mechanism and of the problems of management? Is it surprising that his judgment may not be reliable concerning the immediate and the ultimate consequences of some proposed new mechanism, process or policy? surprising that in the experienced manager's mind the presumption should be against the helpfulness of the workman's judgment of things outside the narrow sphere of his hand or machine craft? Notwithstanding the immeasurable promises of better general and industrial education, the manager's prejudice is not unhuman.

I have suggested that, in the second place, the militant attitude of mind of the workman's organization is also a limitation to the soundness of his judgment of industrial matters. One would, at first thought, believe that the judgment of the group could not rise higher than the average judgment of the individuals constituting the group. But that is not so, for the influence of the leadership of able minds enters into the calculation. In labor unions are very able individuals, who become leaders, and succeed, under certain limitations, in impressing their views upon the group. The group mind should be, and unquestionably is, broader and more sympathetic of the complexity and sensitiveness of the industrial machine, and of the consequences of every proposed policy, than is the individual mind. But is it as much superior, in its actual expressions of itself, as the intellectual ability of group leaders gives us a right to expect and demand?

I believe not, for the reason that the group thinking and action is motivated by a single purpose—a militant effort to achieve class solidarity and class prosperity in the midst of a régime of individual ownership of industrial equipment, managerial control and bartering for a share of the surplus of productive operations. Other possible aims are neglected for, subordinated to, or even misused for, this one dominating campaign. Truth in the statement of known facts, and in the search for attainable facts, is not sought for the sake of the truth, whatever its effect on men's minds. Inaccurate statements are made, and false judgments

uttered simply for strategic and tactical reasons. I am not affirming or denying the historical justice of this motive. I am simply stating what seems to be a fact, and suggesting that the fact is a limitation to the reliability of labor's judgment on new industrial mechanism, processes and policies.

Parenthetically, it may not be out of place to observe that there are weighty reasons for management's hearty support of more thorough general and industrial education; and especially for a calm and dispassionate consideration of the possibilities in some other régime than absolute individual ownership, absolute managerial control and purely individual bargaining.

If these serious limitations to the reliability of the workman's judgment be genuine, what, then, are the advantages in forming judgments on industrial matters which are possessed by the workman and which support my thesis that his judgment is a necessary complement to that of the manager?

The advantages, as I see them, may be summed up in the statement that workmen in the aggregate form industrial society, for the benefit of which industrial operations are carried on; that, as participants in industrial operations and beneficiaries of them, in the aggregate and in the long run they sense the ultimate influence of industrial undertakings. In discussing the advantages for forming judgments possessed by the manager, I described certain faculties for intuitive judgment, developed in him by experience, because his experience is different from that of anyone else, which make him able to perceive certain aspects of truth not visible to others. So it is with workmen in the mass. They also, because of their function in industrial operations, possess experience and develop intuitive faculties which neither managers nor others have. They feel the direction of the current of industrial evolution not because they are carried along in it, but because they are industrial society. Because of this, their intuitive faculties, specialized by their unique experience, sense the immediate and frequently the ultimate influence of specific methods and policies on the current of industrial progress. There may not be convincing reasoning behind their objection to a specific proposal, but there may be something more fundamental than reasoning which guides them.

I am not raising the question of the right of the workman to be called into consultation in determining the desirability of specific industrial methods and policies. I feel that what is right is

probably what is, according to social experience, the ultimately socially expedient. If that is so, what we think and what we do will not deprive the workman of what is his right. I am arguing that, from the point of view of industrial management in a régime of private ownership of the materials of production, of managerial control, of the motive of profits, it is expedient to match the workman's judgment against the manager's and the social scientist's, in order to obtain the benefit of the workman's unique advantages for judgment which, in an increasing proportion, outweight his corresponding disadvantages.

# THE SOCIAL SCIENTIST

I come now to the last of the trilogy of advisers: the impractical, bookreading, theoretical and dreamy social scientist, as some conceive him to be. What does he know about industry—he who does not do real work for a living? What does he know about management—he who is notorious for his inability to manage? I notice, however, that no one asks what he knows about industrial evolution. Knowledge of that, so far as it can be known, is conceded to him. To know about the stream of industrial progress, of which manager and workman are atoms, is his specialized function. If that be so, may he not render judgment of some value concerning practical industrial propositions, especially with regard to whether they are or are not adapted to survive the forces of industrial evolution?

I wish, before considering specifically the advantages and disadvantages of the social scientist for rendering judgments of value to us, to join issue with the implication in the antithesis between "practical" and "theoretical." In making such a contrast one is betraved by a narrow point of view. The concrete proposition which you make today, which you call practicable, may prove to be unworkable next year. Was it really practicable? The theory Professor X proposed today you declare impracticable, but five years from now it may be working. it impracticable? The one was practicable for the moment, but it proved not to be for the long run. The other proved practicable in the long run, but seemed not so at the moment proposed possibly in many instances just because you thought it was not and did not support it. In fact, when you say a thing is impracticable, you mean it cannot at once be adopted, and you may be right. But when you say it is theoretical, you should mean that. while at the moment you believe it to be unworkable, it may in the long run be the fundamentally correct thing. Therein is the contrast you should have clearly in mind. The antithesis is not between "practical" and "theoretical," but between the immediately practicable and the ultimately practicable, between the superficially practicable and the fundamentally practicable, between current practice and principles of future practice.

If the mind of any class of investigators is concentrated on searching out the ultimately and fundamentally practicable, may not their judgments be of great value to the "practical" man who desires to work with the current of the stream which bears him along?

This brief consideration of the conventional error in the use of the words "practical" and "theoretical" suggests the advantages and disadvantages of the social scientist as a competent judge of industrial mechanism, processes and policies.

In the first place, he has not had industrial experience. He, therefore, lacks technical information concerning materials and men. He not only does not know how a given material will react to a proposed process, but he does not know how human nature will react at a particular time to a particular situation. He has not those intuitive faculties developed by manager and workman in the plane of industrial operations, of which I have emphasized the importance. He acknowledges, in fact formulated, the evolutionary principle that development, to be substantial, must come by small increments of change. But, because of lack of experience, he is not a judge of whether a proposed measure is a small or too great an increment of change. Therefore we too frequently find him advocating measures which the manager's reason or intuitive faculties condemn as impracticable, i.e., too great an increment of change. We too frequently find the social scientist advocating measures which, if put into operation, might "strip the gears" of the industrial machine.

In the second place, the social scientist too frequently adds to that disadvantage another—an unconscious assumption that some particular régime of industrial activity, towards which he believes society is progressing, is nearer than it really is, or is actually present. Possibly this disadvantage is but an intensified and specialized form of the first, but it exists and deserves special attention. It causes bias in the observation and in the interpretation of facts, for what a fact appears to be to an observer is

determined in part by the environment in which he believes that fact to exist. For instance, I believe the fundamental error in the so-called Hoxie report on scientific management and labor is of this kind. There are, to one familiar with scientific management in operation, other conspicuous errors; but the great error is that the Committee observed and interpreted facts with unconscious bias. Throughout the report scientific management is judged not as a step in the evolution of industrial society, not as a reasonable and workable advance on current practice, not as a body of principles and mechanism which must fit into the existing industrial régime. Scientific management is not compared with other current management—it is compared with some form of management which belongs to a régime in which industrial democracy is more fully developed than at present. It is not therefore a reliable report on which to base current individual or state action. But just because it makes us consider scientific management in terms of a possible future industrial régime, it is a great report.

What is the relation of the social scientist to industry which enables him to see aspects of the truth which neither the workman nor the manager can see? It is because he is not of industry, but is outside it. Both manager and workman are passing judgment upon something of which they are a part. The social scientist is passing judgment on something which he examines from without. That is a good principle of investigation and valuation, according to scientific management. The professional industrial engineer is impatient of that narrow-mindedness which prompts a board of directors to declare that no one outside their directorate can tell them about their business. It is just because the industrial engineer comes in from outside that he can see things in their business which they, who are of it, cannot see.

The social scientist, because he looks upon the facts of industry from outside and from a distance, gets the broader view and the larger relationships. The manager, intent on the problems of today, is like the person who would attempt to project a curve by two fixed points. The functionalized student of industrial development corresponds to him who establishes three or more fixed points before projecting the curve. Or, to draw another analogy, he is like the military scout on a mountain eminence who searches out the lay of the land to direct the army which is marching through the valleys below. The army below may be defiling

eastward through a valley, and every private and company officer believes that to be the general direction of march; the scout and the higher officers who receive and value his advice know that the general direction of the march is intended to be westward. The scout has the advantage of the distant point of view. On the other hand, the officers and soldiers of the marching columns, with their more restricted outlook, are the only judges of where camp should be made tonight and again tomorrow night, for they are the only ones near enough to determine the most advantageous locations of fuel and water. Both the scout and the captain are practical men, but they are practical on different planes.

It should be noted also that the social scientist, in his broad survey of industrial development, does not rely entirely upon what he sees for himself. He seeks both the manager's and the workman's observations and opinions, compares them with each other and with his own and utilizes them in forming his own final judgments.

The social scientist's judgment of the social and industrial value of any industrial proposition is not less valuable than that of the manager and that of the workman. Each is enabled to observe phases of the truth which the other cannot see. An approach to the whole truth is secured by combining and harmonizing their judgments.

# CHAPTER XVIII

# WHY MEN STRIKE1

BY EDWARD A. FILENE

Why do men strike? Primarily because they instinctively dislike to be bossed. All men dislike to be bossed—employer and employee alike—because experience has shown that no man is wise enough to have autocratic power over another man. Being mere mortals, at our best, we make mistakes; and if these mistakes affect other men who have to submit to them, they are liable to exaggerate the errors, and rebel against them. They believe that if the decision had lain with them the mistakes would not have been made.

Constructive criticism of a kindly nature is scarce. But the average man finds it easy to criticize the mistakes and evils in a thing. There is, therefore, a tendency to criticize and resist the employer on general principles. If strikes are to be avoided, we employers must recognize that the inevitable and normal trend is in this direction. By careful study of the whole situation and by wise, sympathetic organization, we must meet the tendency.

Men strike because they are injured by real mistakes or because they believe themselves to be injured by the terms of their employment. In such strikes they are often unsuccessful and the grievances remain. For these reasons they sometimes dwell upon the objectionable features of their employment until they become tense and bitter. There grows up, in consequence, a distrust or hatred of the whole system. Irresponsible leaders who voice and trade on this discontent easily get a following. There is also a reaction towards socialism or communism which are presented as panaceas for the ills complained of.

For many years I have studied carefully the relations between employer and employee under our so-called capitalistic system. I have also studied socialism and communism as proposed substitutes for it. I am forced to the conclusion that, as men are constituted at the present time, socialism and communism are

<sup>&</sup>lt;sup>1</sup>Reprinted by permission from *Industrial Management*, Dec., 1922, vol. 64, No. 6.

not practical remedies. I am convinced also that the greater part of the wealth of employers is legitimately gained and that all the world is richer because of their wealth. Henry Ford is not the only man who has become rich through serving the public. Many employers' wealth has been, as Henry Holt has well pointed out, "derived from processes and economies of his own devising and directing, without which his income would not exist at all and the income of his employees would be less."

But firmly convinced as I am of this truth, I am just as firmly convinced that the present system is not infallible or final, but is only a step on the road from serfdom and slavery to improved forms of just and effective cooperation that the experience and wisdom of men will evolve from generation to generation. But as the present system is the road that must for the present be utilized for the upward march of all of us, employer and employee alike, we employers will do well to study it carefully with the object of understanding its weaknesses and remedying its defects.

My study of industrial relations has convinced me of four things:

- 1. That, in a political democracy such as ours, the autocratic control of industry by employers is a fruitful breeder of strikes and is in the long run impractical.
- 2. That we often pay counterfeit wages when we intend to pay real wages, thus causing discontent, conflict and strikes.
- 3. That the present so-called capitalistic system has accumulated, and is still using, outgrown ideas and customs that are needlessly offensive to our employees, and that it needs to be brought up to date.
- 4. That the basic remedy for the evils of industrialism, and hence for strikes, lies in making business a profession—that is, in realizing, in act as well as in thought, that a business has no right to make a profit except as it serves the community.

Let us briefly review these four conclusions:

Autocratic Control of Industry.—All of us employers are believers in the right of private property. Almost all of us translate that faith, consciously or subconsciously, into conviction that our property is so completely our own that society should keep its hands off of it. We hold that if it must touch our property at all it should do so only to the slightest possible extent, and only after having first recognized and acknowledged

that it was interfering with our rights. Of course, any analysis of this position shows that it is not very sound. It amounts to setting up property rights as superior to personal rights; to an appeal to society to safeguard our selfish interests against the common interests of the society to which we appeal; to an insistence at times on the duty of government to protect us in our imagined and artificial rights to the detriment and loss of the whole group of citizens of which we are a part, and this view tends, unfortunately, to develop an autocratic spirit among us.

Applying this idea of property, as exclusively our own, to our relations with our employees, we probably feel that we have undoubted right to determine the conditions under which these employees shall work, provided we do it lawfully. And here we find one of the reasons why men strike—a source of grievance which can be shown to be the real cause of many strikes where other reasons are put forward. Most of our employees—all of those who have been educated in this country—have been taught from childhood that it is their inalienable right as freemen to have a hand in determining the political laws under which they live. They have heard it reiterated by their teachers in the public schools and by the interpreters of our free institutions on every public occasion. They read it in the daily press.

Men so taught are not going to stop short of applying this axiom, that grows out of the political system under which they are governed, to the industrial system under which they live and labor. Inevitably they are claiming the right to have an effective voice in the determining of conditions under which they work. These economic conditions are even more important to them than the political conditions. They have occasion for the expression of their political views at infrequent intervals. They are conscious of the exactions and burdens of government only now and then. But the urge to have an adequate voice in determining industrial conditions is daily, yes hourly, insistent. Every accident that is costly to labor, every additional expense in their living, every new baby, every new ideal, every new material desire, such as an automobile or a house, serves as an occasion for reopening the question whether their wages are justly and generously determined. The result of such questioning is surely a further incentive in their minds to the greater assertion of their rights, as the preponderant human factors in industry, to have a voice in the control of conditions of labor and of the rate of wages. And this assertion of right, if opposed by the employer, often means another strike.

Then to this is added the periodic recurrence of bad times, with its masses out of employment, and the fear of the loss of the job—one of the most terrifying apprehensions of the average working man with a family. Under these conditions men feel themselves compelled to fight, by strikes or otherwise, for a greater voice in determining the conditions under which they labor. They are led on by the idea that if they have this greater voice they will so regulate and control production and distribution that not only will there be no fear of loss of the job, but there will also be sufficient wages to satisfy their needs and their desires.

My own lifelong experience and study as an employer convinces me that autocratic control by employees would be even worse than autocratic control by employers. There is nothing in democracy that can perform miracles in production and distribution. There is nothing in the democratic principle in industry that in itself will take the place of expert knowledge, technical skill and trained industrial vision. No man in the factory, whether employer or employee, if he were hurt by a machine, would be willing to have a committee of his fellow workmen meet and vote how badly he was hurt and how he should be cured. They would send for the trained, skilled specialist, the doctor or the surgeon. Likewise, when the business is hurt, it cannot be cured by a vote of management-sharing employees, unless those so voting are mentally and technically trained to know what they are voting about and are basically so interested that they will put their best into their decision.

It all comes to this, that autocratic control, whether by employer or employee, is bad—the one almost as objectionable as the other; and that men are striking today as a protest against autocratic control by capital, and as the most effective way of expressing their demand for an adequate voice in the conditions under which they work.

They are vitally interested. They will continue to strike until provision is made for giving them adequate representation in boards of directors or in those shop committees, by whatever name they may be called, in which employers and employees work hand in hand to advance both the business and the legitimate interests of the human beings who put their lives into it and

get their livelihood from it. This is now largely recognized by employers and the growth of these joint committees has for some

vears been marked.

But even if joint control of management is immensely successful, it will not alone recover all the grievances that make men strike. It is necessary now to examine into the second of our causes.

Inadequate Wages.—A large proportion of the industrial disputes and strikes occur because the employee receives an inadequate wage—a situation for which the employer is not directly responsible. An industrial system which subdivides the manufacturing process until the individual worker is only a part of the machine, and which then denies him participation in management, must of necessity leave him with little if any interest in the business. His main concern will then be in the wage return he gets for his work. Under such conditions, any interference with those wages that reduces their purchasing power is a serious matter, sure to create discontent and conflict.

Counterfeit wages is a term that I have invented—whether good or bad you must judge—to characterize this inadequate wage that comes about from some of the many causes that reduce the purchasing power of money. Counterfeit wages are any wages, however large they may be, in dollars that will not buy the necessities of life and enough luxuries to make working for necessities a desirable thing and also to enable the recipient to make modest but adequate provision for sickness and old age. Counterfeit money has no value. Counterfeit wages have too little value when measured against the purposes which wages must serve. It is not a question of how much a man receives, but of what he can buy for what he gets. Wages may double, but if prices are more than double then wages are counterfeit to the extent that prices have outrun the increased wages.

The causes that turn a good wage into a counterfeit wage are various. The speculation or the profiteering that raises the cost of homes, the rent of houses, factories or shops may make a draft on the pockets of numberless employees that goes far to turn hitherto adequate wages into counterfeit wages. Speculating or profiteering in the necessities of life has the same result. Manipulation of securities of public service corporations that raises the price of street car fares, gas and electricity helps to turn a fair wage into a counterfeit wage. The enactment of tariff laws that,

by crippling our foreign customers, shut down our factories at home, or, by fostering bad trust agreements or undue profits, increase the cost of domestic goods, help to make wages counter-The merchant who by costly methods of retail or wholesale distribution adds unduly to the manufacturing cost of commodities make inadequate and counterfeit a wage which might be adequate if goods were sold with less expense. The excessive fixed charges that result from watered stocks and from capitalizing expenses, or unfair "good-will" values, raise the living cost of the purchaser and increase the counterfeit margin of his wage. The inefficient and expensive government, local, state and national, which results from our easygoing American methods of choosing untrained administrators and from the partisanship that neglects the principles of good government in the effort to get and keep office, cuts down the value of every dollar that goes into the pocket of the workman—helps to make them counterfeit. The limiting of output by labor unions, resulting in fewer and higher cost products, is a method by which the working men themselves turn their own dollars and the dollars of other wageearners into counterfeit. Wittingly or unwittingly, employers and employees alike are often wage counterfeiters.

The fact that wages, however large, will not buy the things our employees want and need induces discontent and a sense of being thwarted and wronged. This discrepancy between income and needed outgo makes men ready to listen to the irresponsible agitator who tells them that they are deliberately and constantly being robbed by employers or by organized finance.

The method of thinking of wages in terms of dollars rather than in terms of commodities, recreation and savings is one that must be changed. There is nothing sacred about it. Together with many other unscientific and indefensible features of civilized life, it just "happened" to grow up. Discontent and strikes as a result of counterfeit wages will continue until a method of determining wages is adopted that will keep them fairly proportioned to the outgo essential to the maintenance of the American standard of living—a standard on which we Americans justly pride ourselves and which we employers are generally as willing to pay as our employees are to receive.

The return for paying genuine rather than counterfeit wages more than makes up to the employer and to society for the extra money expenditure. The genuine wage tends to provide happy, healthy, contented and loyal employees.

If their wages are adequate to provide the necessities of life for their families and allow also for recreation and provision for illness and old age, they are increasingly freed from worry and are thereby made more efficient employees. If their wages enable them to buy freely, the value of the American market is maintained, to the profit alike of the manufacturer, the farmer, the workman who makes and the merchant who sells the product of the factory, the mine and the farm. Best of all, it will remove one of the most fertile causes of strikes.

An important part of the responsibility for the adequacy of wages must be assumed by us employers. We are sometimes little schooled in theories of social welfare, have little imagination outside of our own immediate field of business management and are prone to think of our duties in terms of money, success or failure, to the exclusion of terms of human welfare. It is most often members of our own employer class, also, who turn real wages into counterfeit. This being the case, we cannot easily justify ourselves in taking a position of irresponsibility in the premises of our argument. The responsibility for reducing the excessive costs of retail distribution belongs to me and to my fellow retail merchants. We employers should fight all excessive capitalization whose fixed charges help to turn into counterfeit the otherwise adequate wages we pay our employees. Our men of finance should see to the adoption and enforcement of the English law which requires a statement to be made to every purchaser of stock showing the promoter's profit and the real assets and liabilities of the company. It is up to us to help provide credit unions or other safe and democratic means of saving and investing earnings. The training of the wage-earner in the use of his money, so that by purchasing merchandise of good quality at the lowest possible price he will help to keep his wages real, is also our responsibility, at least to a degree. Our responsibility is at least equal to that of our employees to see to it that they are not compelled to pay a street car fare of 10 cents to get to and from our places of business, when devoted and wise administration of public service corporations might make 5 or 7 cents adequate. The same thing applies to railroad fares and freight rates. The responsibility to provide comfortable, attractive and sanitary housing at fair prices primarily belongs to

the employer of labor. In any event, we are responsible if we allow speculation in land and housing so to increase rents as to make wages counterfeit.

Our influence should be thrown, I believe, against excessive tariffs and other forms of interference with trade that, if they increase the profits of the employer at all, do so at the expense of the wage-earner, of the farmer and of the general public.

We employers should also make use of the price indexes provided by the Department of Labor at Washington, and by several private agencies, as a scientific and business-like aid in an attempt to solve the problem of counterfeit wages through use of a sliding wage scale. It may be that the stabilization of the purchasing power of the dollar along the lines advanced by economists will sometimes help to remove some of the problems of the counterfeit wage. A scientific solution is highly desirable, but it may take many years to bring it about.

If we employers are to have fewer strikes in the meantime, we must learn to think more of wages in terms of what they will buy than in terms of dollars and cents. When we do this we shall do away with many of the causes of counterfeit wages. Because a man belongs to our club or our church will no longer be a reason for our standing by supinely and allowing him, by manipulation, speculation or profiteering, to make counterfeit the wages we pay.

Outgrown Ideas and Customs.—Let us now turn to a third reason why men strike.

We all recognize the truth of the statement that our present so-called capitalistic system is still using inherited ideas and customs that, although not discarded, have really been outgrown. We know also that it needs to readjust its ideas, get rid of old abuses, and reduce the number of points at which friction between employer and employee is generated. Because I am not ready to burn my house down is no reason why I should not repair or replace a dangerous plumbing system. Because we are not ready to destroy the present organization of industry and put socialism or communism in its place is no reason why we should not get rid of its abuses and bring it up to date.

Many employers and important organizations have made and are still making attempts further to humanize and improve our industrial system. One of the most significant, as well as most courageous, is that made by the Federal Council of Churches of America in formulating and publishing its social creed. This

social creed is of very great significance, emanating as it does from a body that represents substantially a half of the American people, and which is one of the most conservative elements in our American life.

This formulation is a creed and an ideal rather than a program of action. Difficulties and differences of opinion will no doubt be encountered in forging these ideals into a working program. Some of them may need to be restated and revised. It is a statement, however, which employers cannot afford to overlook or ignore. Progress is going to be made toward their achievement, and leadership will come into the hands of those who undertake to apply, in good faith, such principles as the churches have here formulated. It can hardly be doubted, moreover, that the stability of our social and economic institutions will depend in no small part on the growth among employees of confidence in the right-mindedness and right-heartedness of the leaders of business and industry.

I have not the space at my disposal in which to discuss at length a social program. I may be indulged, however, in pointing out certain as yet partially achieved goals which a consensus of informed opinion, both among employers and employees, recognizes as practical and just. This moderate program, if achieved, would go far toward doing away with strikes.

The right of employees to a voice in determining the conditions under which they shall work and to a stable and living wage have already been dealt with. Other goals which are now generally recognized as right and just include:

- 1. The right of employees to unite for purposes of collective bargaining.
  - 2. A gradual and reasonable reduction in hours of labor.
- 3. Compensation for industrial accidents as a just charge on industry.
- 4. The right of labor to be safeguarded in all matters pertaining to health, steady employment and good working conditions.

Men and women fit for American citizenship, the working hours of whose lives must be spent in stores and factories, in mines and on farms and railroads, must and will demand just solutions of such problems as are presented by these statements of principle. It is to the advantage of us employers to lead in finding these solutions. It is to the advantage of the consumer and of society that we shall do so. If the elimination of outgrown ideas and

the righting of old wrongs is left to labor alone, wage conflicts and strikes will continue on an increasing scale. The strike is their principal weapon. If they are forced to fight for their rights, they must and will use it.

A great employer of labor said to me during the war:

When we employers in the past have had the advantage of our employees by reason of an oversupply of labor, we have used it for our own selfish ends. Labor now has the whip hand and is merely doing to us what we have done to it in the past . . . I wonder which of us will be wise enough to end this wasteful process of industrial conflict by first using its period of power wisely and generously?

The opportunity of the employer has now arrived. The future relations of employer and employee will depend in no small degree on whether or not employers as a group, by hard thinking and friendly conference with our employees, will go honestly at work to bring the industrial system up to date.

The Profession of Business.—Important as are the three matters of which I have spoken, for the establishment of good industrial relations, there is, in my judgment, a fourth reason of a still more fundamental nature—namely, that business shall more and more become a profession and be carried on in a spirit of service to the community.

The motive with which the employer directs his business and with which the employee works will in the last analysis determine whether there will be industrial war or industrial peace.

Asked recently to prepare an article on 'A Simple Code of Business Ethics' as one of a series of studies on the ethics of the several business and professional groups, I ventured to base it on these two brief formulas:

- 1. That a business, in order to have the right to succeed, must be of real service to the community.
- 2. That real service in business consists in making or selling merchandise of reliable quality for the lowest practicable price, provided that merchandise is made and sold under just conditions.

The merchandise must be sold as cheaply as possible so that as many as possible may buy as much as they need. It must be made and sold under just conditions, as one must not oppress his employees in order to make merchandise cheaper than it should be to his customers. But the chief point of the ethics of the profession of business, as I understand it, is that the great

buying public is to be served by giving them dependable merchandise at an ever cheaper and cheaper price.

One of the tragedies in our industrial life of today is that when we employers are finally successful and the difficulties and perplexities which in our earlier years prevented us from giving full cooperation in solving the problems of our employees are over, and we have at last gained the financial freedom that enables us to decide questions between ourselves and our employees on their merits, we so often fail to use our new-found freedom to this end. We often begin, instead, to use our thought, time and money to build bigger houses than we need, to buy too expensive pictures and live in a needless luxury. We men have learned to simplify our clothing so that neither in cost nor styles is there a yawning gulf betwen those of employer and employee. But only rarely do we keep our living simplified to any such degree. But even if we are too sensible or public-spirited for ostentatious display, we feel that it is our first duty to give large sums of money for hospitals and other philanthropic purposes. For these and like reasons, we throw away the opportunity, won by a life of successful labor, to heal the wounds of industry.

Philanthropy becomes a sin and an offense when it uses for charity the earnings of industry that should be used for justice to employees and the public.

The first legitimate use of large profits, and the main use, is to reduce prices. These lower prices will, in turn, cause increased demand, increased production and increased total profit, at which point prices can again be reduced. It is worse than useless merely to increase production. Prices must at the same time be reduced enough to bring in the greatly increased number of purchasers needed to absorb this greater output. Employers are wrong when they endeavor to obtain mass production through lowering wages to a degree that lessens the number of possible consumers for their product. Employees are wrong when they try to get higher real wages or more work through limiting output. Both will find it far more profitable in the long run to join hands in efforts to furnish reliable and essential merchandise to the public at prices lower than it has been sold before. In this way they will greatly increase the number of consumers and increase the demand for workmen. They will at the same time increase wages, and the purchasing power of those wages,

When this spirit of service comes to be generally recognized for what it is, namely, good business as well as good ethics, the reasons for strikes will have been greatly lessened. The cooperation that will result between employer and employee—between management and labor—is perhaps the nearest we shall need to come to common ownership or the socialization of industry. Perhaps here is the door through which the strike will make its exit and industrial peace will enter.

The practical and compelling thought in any analysis of the reasons why men strike is found in the fact that the elimination of the cause of strikes is not only good ethics but equally good business. We employers like to think of ourselves both as good business men and as good Americans. In studying and removing the reasons for strikes, we shall find the road to that real cooperation with our employees that will largely satisfy our aspirations in both directions. And a grateful general public, which after all is most concerned in the solution of the industrial question, will applaud and reward our success.

# CHAPTER XIX

# SCIENTIFIC MANAGEMENT AS APPLIED TO CORPORATE STRUCTURE<sup>1</sup>

# BY HENRY S. DENNISON

There are few of us who have not at one time or another found valuable assistance in the backing of owners who knew something of their business and whose purposes were somewhat broader than merely to obtain this year's profits; or who have not met with discouraging obstacles in the attitude of absentee owners whose eyes were focussed on the stock market.

Certainly, in the broad field of industrial relations the testimony of F. C. Hood, President of Associated Industries of Massachusetts, in his report of October 24, 1919, is fairly conclusive. In that report Mr. Hood said that he estimated that 80 per cent of the cases which came before the National War Labor Board, of which he was a member, came from those concerns in which the general management was not at the place of operation, that is, absentee management.

For better or worse, then, I should like to make the roughest sort of preliminary analysis of the major interests at stake in the modern corporation. I shall then take the liberty of reporting upon the steps that we have so far taken in our own corporation with the idea of meeting these interests and harnessing them all more or less effectively into the service of production.

It seems to me that no industrial system can hope to persist whose primary purpose is not production and efficient distribution and which does not use to this end all the necessary factors. I take as the four chief factors Capital, Management, Labor and the Customer. Their purposes in the industrial structure are too well known to dwell upon; their necessary rewards will, however, bear close analysis.

# I. CAPITAL

1. In the first place, it is necessary to make a payment to capital for its use, a payment sufficient at any given state of the

<sup>1</sup>Reprinted by permission from the Bulletin of the Taylor Society, June, 1920, vol. 5, No. 3.

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market to induce the investment of savings rather than their expenditure. This rate is approximately the savings bank or government security rate.

- 2. For industrial purposes a payment must be made in addition to the above to cover the normal risks of industry. The rate required to cover use and normal risk is fairly well illustrated at any time by the rate at which good industrial preferred stocks are selling.
- 3. Capital at normal risk is likely to require some provisions in the nature of insurance, such as a sinking fund for its gradual retirement or a liberal depreciation policy. A common provision for the insurance of capital at normal risk is to grant to such capital powers of control in case the agreed payments of interest and dividend cannot be kept up.
- 4. In addition to these conditions, there is in practically every business—certainly in its early years—a special risk. The necessary payment for this special risk must, of course, be determined in each case separately, and must be determined by the bargaining process. Special risks may warrant an agreement to pay, if earned, large rates of dividend on common or preferred stocks, but there are few special risks for which some definite maximum agreement cannot be made.
- 5. To obtain capital in the first two categories, it is seldom necessary to grant it voting privileges; for bonds and preferred stocks, voting powers usually develop only upon breach of contract. For capital at special risk, voting privileges are more appropriate, but it is not by any means always necessary to make such a bargain for capital that voting privileges continue after the special risk stage is passed. It is after this stage is passed that the voting powers become inappropriate and liable to cause difficulties.
- 6. Capital is in one respect vitally different from the other three factors. When once purchased, its service to the corporation cannot be materially affected by variation in reward. Bonuses to capital may have a part in inviting new capital into the business but cannot obtain added service from the old. In this respect capital once obtained resembles more closely the facilities of a business—raw materials, buildings, machines, etc.—than the live human factors of management, labor and the trade.

## II. MANAGEMENT

1. The corporation must pay for the use of management with salaries.

2. It is probable that normal risk enters as a very real consideration in obtaining management; that is to say, it could probably be shown that the average salaries for ultra-safe positions—government jobs, savings bank jobs and the like—are lower than salaries for similar positions in business houses, where the chances of loss of job are greater.

3. The only consideration which might be taken to resemble insurance lies in the expectation of those taking managerial positions that they will be paid through good times and bad and given

a reasonable allowance of time for sickness.

4. Payment for more than normal risk is only rarely made by higher salaries. The dynamic force of a reward varying with the success or non-success of the venture is a more common and effective means of payment. Besides the provision of reward for success, there can very effectively be provided a penalty for failure. This is very simply arranged where the management and the owner of capital are one and the same; or can be provided by giving the members of the management shares of common stock at the time of incorporation, or from year to year afterwards as a share in profits.

5. Control is, by definition, the natural function of management. Its daily specific control obviously must be in close concord with other general or partial controls, whether exercised by stock-

holders' representatives, labor unions or government.

6. With management, the dynamic force of the bonus is of primary importance. Management stands at the center of all the forces of the corporation performing the functions of inspiring and coordinating their activities. Any reward to management which might link its destiny intimately with that of the corporation should therefore lend strength to the whole structure.

## III. LABOR

1. The payment for the use of labor is the basic wage.

2. Normal risk may enter as a consideration, but labor at anything less than normal risk is so scarce that its consideration is of academic interest only.

3. Labor has not until recently been in a position strong enough to raise the question of insurance. We have started with accident compensation and obviously must soon set about the working out of the problems of insurance against irregular employment. Even if the bargaining power of labor has not heretofore been great enough to insist upon these insurance provisions, it is reasonable to suppose that they are of an interest and value to labor similar to the interest and value to capital and management.

- 4. Special risk payment for labor is, for our purposes, an inconsiderable matter.
- 5. Control, with labor, is not a function of the risk of the business but of an entirely different variable. Labor has shown itself for the most part free from any desire to control or to have part in the control of the general affairs of the corporation. It selects from among the corporation's activities wages, hours and such working conditions as most immediately concern labor, and is more and more insistent in demanding a voice in the control of just these matters.
- 6. The dynamic value of varying rewards to labor is generally recognized and met in the payment of piece rates or performance bonuses. It is becoming clear, however, that while labor is not so intimately tied into the corporation that its reflex effects are as vital as those of management, nevertheless its connection is more vital than has been our habit of thinking and its collective will, therefore, of greater concern. It will probably pay, therefore, other things being equal, to enlist the collective interest and good will of the worker by appropriate means.

# IV. THE CUSTOMER

- 1. The use of the customer's service whether as distributor or consumer must be paid for by affording some value to him greater than any payment he must make for the corporation's goods, or incidental to their use or resale.
- 2. Normal risk may be presumed to reside in such goods as branded lines as against the great staples, such as cotton, wheat, copper and the like. To handle these lines a slightly greater margin would be expected by the retailer or somewhat more careful purchasing effort exerted by the consumer.
- 3. Insurance against loss to the customer is to be thought of only in connection with special risks and then takes some form similar to sale by consignment.
- 4. Special risks are not generally assumed by a customer. The corporation itself must usually stand behind the success of new

ventures until the quality of sample lots is pretty thoroughly determined or resale goods introduced soundly into the market. Common instances of customer's special risk are seasonal and fashionable goods. On such goods the dealer demands a larger margin of gross profit.

- 5. In the normal market the equal bargaining power of the customer usually provides a sufficient share of control. As in the case of labor it is not related to risk but rather to that class of the corporation's activities which interest and affect the customer; the customer desires, and in the normal market achieves, a voice in control of styles, prices and deliveries in much the same degree and sense in which labor would achieve such a voice if the bargaining power had been in the past more nearly equal to that of the employer.
- 6. Rewards for the customer varying with performance are ordinarily provided by the customer's own activities. There are, however, a few instances of special bonuses for quantity of purchases and devices for a share in profits which have been instituted as attempts to gain the dynamic values of the customer's active cooperation.

Forces and factors must be analyzed along some such lines when scientific rather than exclusively legal attention comes to be given the problem of building or rebuilding the structure of a corporation. Present practice applies the dynamic forces of gain and loss chiefly to that factor which has the least power of direct response, necessitating the provision of a somewhat artificial power of response through election of the normal controlling factor. The personification of capital arose naturally enough when capitalist and manager were more frequently one and its superior powers were normal to its great scarcity in the early part of the nineteenth century. A permanency beyond the days of special fitness of these attributes resulted from the legal invention of the business corporation as a fund of money or value in substitution for the older partnership or group of men.

## V. STEPS TAKEN

The Dennison reincorporation in 1911 really forms a combination of partnership and corporation by crediting to capital in the hands of members of the management quite different responsibilities and rewards from capital of outside hands, and by assigning ownership of the annual increment, or reinvested surplus, to management rather than to capital. Its present structure may be described in conformity with the method of analysis here suggested, as follows:

Capital.—1 and 2. It was possible to pay a fixed lease for the capital which had been invested and reinvested up to 1911. The rate was 8 per cent on an amount which included \$1,000,000 valuation for good will, or about 10 per cent on value of real and personal property.

- 3. The insurance provisions include preference in assets and dividends and control in case dividend payments are seriously delayed.
- 4. A rather mild special risk was met by giving control to capital until additional tangible net assets to the amount of the good will account had been accumulated.
- 5. Capital's control is a function of risk; it has no voting powers under normal risk conditions.
- 6. No fluctuating payments are made to capital under normal conditions; new capital may be purchased under such terms as the market may make necessary.

Management.—1, 2 and 3. Monthly salaries and informal understandings as to regularity of employment cover use, risk and surety.

- 4. By the distribution to members of the managerial force of the equity in each year's reinvested earnings and through capital's preferential treatment the management becomes joint owner of that portion of the capital which is always subject to special risk and where dividends fluctuate with earnings.
- 5. Under normal conditions and as long as it is successful, management has sole control, exercised by the usual method of stockholders' election of directors. The voting rights of this stock cease as soon as its holder severs connection with the managerial group.
- 6. The dynamic powers of management are spurred by the full force of the profit and loss account and in each individual case by the chances for advancement in salary and position as well.

Labor.—1, 2 and 4. The "going rates" of wages form the bases for payments for use and normal risk.

3. Power of appeal to an Employees' Committee in case of discharge, the accident compensation law, a fund for relief of

unemployment and an informal pension plan—all are classified as labor insurance provisions.

- 5. Through their various unions, but chiefly through the works committee plan, labor has just about the field of control and in just about the degree it desires and can handle effectively.
- 6. Payment by results is a most important spur to the dynamic powers of labor, but is by no means the only one relied upon. A considerable number of plans and policies focus upon the development of internal good will, among which is the recently installed extension of the industrial partnership to labor in the form of a service bonus.

Customer.—Relations with the customer are of the usual types, based upon equal bargaining power and mutual good will.

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